The IRON AGE
April 9, 1959 A Chilton Publication The National Metalworking Weekly

Mediation Chief Joseph F. Finnegan—

## Analyzes 1959's Union-Management Crisis P. 67

What Steel Users Report on Inventories – P. 53

Meteorites Give Clue To Re-Entry Problems – P. 93

Digest of the Week – P. 2-3

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# The IRON AGE

April 9, 1959—Vol. 183, No. 15

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month. After 45 days, the pressure would become irresistible for a settlement. P. 53

### FOREIGN RESEARCH

**Aids U. S. Industry**—It's a growing trend. American firms are filling gaps in research with overseas help. Companies with specialized problems are prime prospects. P. 56

### HIGHWAY SAFETY

**Horsepower Reprieve?**—Some of the blame for auto deaths has been lifted from high-powered engines. A Bureau of Roads study shows that old cars, poor roads, and darkness are culpable. Superhighways are safest. P. 71

### BOEING'S SPACE PLANS

**Large and Ambitious** — Boeing at Seattle is determined to keep well up in race for space age sales. Now underway: Plans for building an

# Metalworking

**MEDIATION CHIEF:** Joseph F. Finnegan, director, Federal Mediation and Conciliation Service, gives his views on the collective bargaining outlook. In an exclusive interview, the mediation chief discusses the factors behind changes in collective bargaining demands. P. 67

observatory on the moon and a man-carrying space glider. P. 77

### MACHINING FACTS

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## FEATURE ARTICLES

### METALLIC METEORITES

**Key to Re-Entry?** — Even the fastest missile seems slow compared to the average meteor. Many clues to the nature and severity of the re-entry problem can be found in a meteor's surviving fragments or meteorites. Some can be evaluated by using relatively simple metallographic techniques. P. 93

### STRUCTURALS

**Conveyors Speed Process**—Designed just to get around the difficult handling of huge beams, a new line offers flexible production in structural steel fabricating. Key to handling are conveyors which link machines for continuous processing. P. 98

### SPECIAL MACHINES

**How to Buy** — There are right and wrong ways to buy special purpose machines. An executive engineer offers some valuable pointers. Key to success is in a cooperative engineering program on a cost sharing basis between purchaser and supplier. P. 100

### TRANSFER MACHINING

**With Numerical Controls** — A combination of numerical control and automatic transfer can do a boring and drilling sequence in record time on mixed parts. With numerical control, changeover is a matter of a few minutes. P. 104

### HOT-DIP GALVANIZING

**Mechanize for Savings**—A new machine controls the entire hot-dip galvanizing cycle to produce quality work in record amounts and at low cost. It will handle a broad range of products by either basket or rack method. P. 106

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### LINEPIPE SALES

**Clearing Horizon** — Linepipe producers have more than the current flurry of strike-hedge orders to encourage them. More important is the prospect of coming sales for new oil and gas lines. P. 58

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**New Orders Jump**—Upsurge in new orders puts rate of new business close to record levels. Although concentrated in primary metals, trend to placing business far ahead is spreading through industry. P. 65

### DEFENSE CONTRACTS

**Renegotiation Deadline**—If you believe renegotiation of defense contracts can be improved, now is the time to speak up. The government's deadline is June 30. P. 75

### A LONG GAMBLE

**Steel Users Take a Chance**—Some steel users are taking a chance there will be no strike. So they are not building inventory. The big question is whether gamble will pay off. P. 137

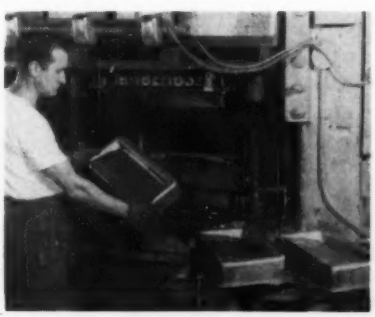
### DRIVE EQUIPMENT SALES

**Steady Improvement** — Orders for mechanical drive equipment are showing continuing gains. Prices are stable, but boosts in wages to steel or rubber workers will probably mean increases. P. 138

## NEXT WEEK

### STAMPING TRENDS

**Make or Buy** — Independent stampers saw the trend to more captive shops several years ago. Since then, they have tried to reverse it. Next week's special report tells what success they have had in convincing users it's better to buy.



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FRANK J. DECRANE, *Director of Purchases, Lamson & Sessions, tells why he believes...*

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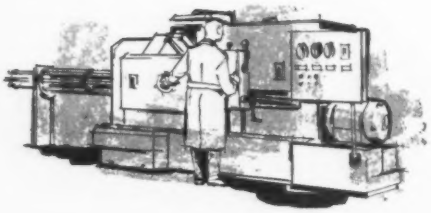

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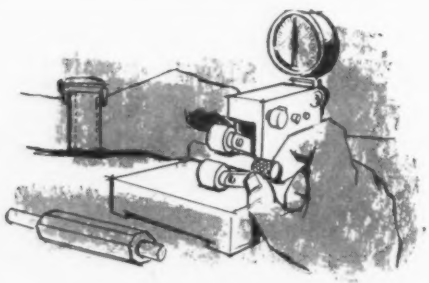

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# Its Back to the Wall: That's Where Business Is!

Causes are lost because we wake up too late to know how far the damage has gone. Cynics often say we can't do too much about things: That's the way the wheel turns, they argue. But if we had listened to the cynics every time, the world would have gone to pot long ago.

Amid domestic and international crises are curious trends that should terrify all businessmen. They should sense the way the wind has been blowing but they have been too busy to realize the seriousness of the situation.

Business has its back to the wall whether it knows it or not. Unless people and legislators in this nation understand just what part industry plays in our country's strength, eventually we will have government control. If we have government control of business—either by law or by intimidation—we will become a second class nation.

Those who should know this are labor leaders, voters, and legislators. Businessmen know it. But often they are lax in explaining and arguing the part free endeavor plays in our future.

There are those who, through ignorance or even by diabolical connivance, want government control over our lives. Often such suggestions include pious flag waving tactics. The pitch is that "nothing will be done to hurt free enterprise." But that is the way all totalitarian moves get started. What's the difference whether business is in a straitjacket by law, by threat, by ignorance or by "plan"?

Government thinking about the oil industry is dangerous to basic freedoms. The Administration's and Congress' thinking about steel labor negotiations borders on threat and intimidation. Back room talk about the "need" for peacetime controls over wages and prices should appall us. All this should alert the most average person.

It should be clear that what is complex for the experts can't be settled by committees of uninformed—or biased—people. Bureaucracy and red tape are robbing this nation of its strength and ability to cope properly with its problems.

It is morally dishonest to use business as a whipping boy in order to further questionable labor demands or practices. Killing or maiming free enterprise in the name of "do-gooding" weakens one force which helps to support our existence and aggressiveness.

The time is distressingly late!

Tom Campbell

Editor-in-Chief

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## Carbide Coating for Tools

Field and lab tests of a new spark-deposited coating for tooling show excellent results. While no substitute for solid carbide, HSS cutters plated with tungsten carbide show for 100 to 400 pct better life. Tools must be replated after each sharpening, but costs are reasonable. Specialty firms will service tools for small companies.

## Automate Tuyere Control

A new system balances the flow of blast air through tuyeres of a blast furnace. The setup for each tuyere consists of a flow nozzle, a balanced flow transmitter, a stacked diaphragm controller, a strip chart recorder, a four-way valve positioner and a ceramic-lined butterfly valve. The method controls superheated air to improve combustion and prevent hot spots and loss of valuable fines.

## Plate Supply Predictions

**Plate buyers are watching the upswing in heavy plate fabrication work with some apprehension. Buyers who thought they'd accumulated enough inventory to cover production in the event of a steel strike, are beginning to predict they'll hit July 1 with less than a normal 60-day stock on hand.**

## Records Material Handling

A new clock-like device measures and records distances traveled and loads handled by lift trucks and similar material handling equipment. It also synchronizes and correlates these figures for any period of time. Manufacturer claims its the first practical and reliable method of measuring and recording equipment performance in order to establish and maintain standard rates.

## Boost in Casting Quality

A new process produces castings, both of carbon and alloy steel, with properties of superior quality over forgings of the same chemistry and heat treatment made by conventional methods. It eliminates inclusions, small voids, hydrogen flakes, dendritic pattern, segregation, poor ingot surface and there are no losses due to hot tops. The temperature of the refractory mold is maintained close to the melting point of the metal during pouring. Physical jarring speeds simultaneous solidifying.

## Depth Gage Saves Time

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## Reliable Missile Parts

Stricter demands for reliability in parts and components for guided missiles are probable. The armed services hear this advice from Congress: Rewrite your specifications, placing more stress on reliability. A House group notes that the services differ in their emphasis on reliability. It urges the Defense Secretary's office to survey these differences and make corrections where needed.

## Freight Car Identification

**An electronic identification system for freight cars in a moving train consists of a response block fastened to the underside of a freight car and an interrogator coil below the track. Each block emits an individual signal which is recorded as a serial number. Block needs no maintenance.**

## Aluminum-Coated Satellite

A 150-lb plastic sphere is to give U. S. new data on radio communication techniques. Sporting an aluminum coat, the satellite will be launched next fall to orbit at 100 miles altitude. Once aloft, it will inflate to 100-ft diameter. Coating of aluminum will permit reflection of radio signals back to ground stations. Two more such satellites are to be launched in 1960.

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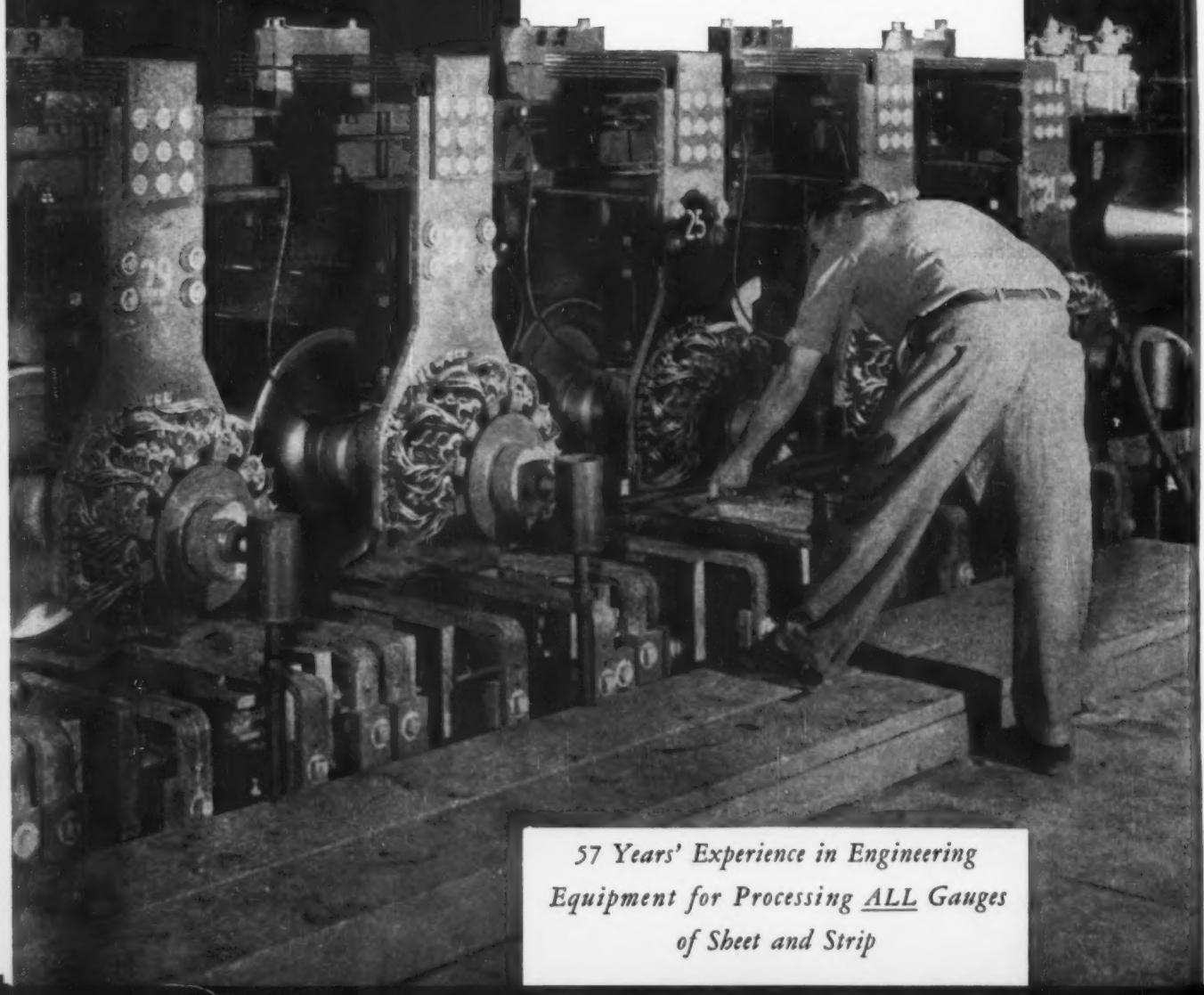

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## LETTERS FROM READERS

### Whose Business?

Sir—I want you to know what a fine editorial you wrote in the March 19 issue on "Steel Company Profits: Whose Business Are They?"

This editorial is excellent, and I believe you have done a great service in publishing this material.—C. F. Hood, Pres., United States Steel Corp., Pittsburgh.

### Whose Bane?

Sir—For a long time I have followed, appreciated, and applauded your editorials. They are basically sound and have helped guide my thinking on many subjects.

It makes me a little sad, therefore, to disagree with your editorial in the March 12 issue "Outside Interference—Bane of Steel Labor Talks."

My question is "Why is this a bane?" As your article states, the steel companies have had all sorts of pressure put on them by the unions, government, customers, and the general public. As a result, they have fallen into the habit of capitulating and possibly may do so again.

Now this is not just Mr. McDonald's business or Mr. Blough's business, but affects everyone in the country. It is, therefore, everybody's business.

So, again my question—Why? Collective bargaining with total union monopoly on one side has become a cliche—almost a mockery. It is as you say "heads I win, tails you lose."

Therefore, why shouldn't the common citizen try to put pressure on important people—try to get them to take action in resisting this same recurring pattern?

Wouldn't widespread, universal "outside interference" be one of the most desirable actions we could take? Let's try to be consistent and recognize that "outside interference" may be the answer in stiffening steel's resistance and undermining Mr. McDonald's demands.—W. F. Herdrich, Birmingham, Mich.

### Ductile Iron

Sir—We were very interested in your report on ductile iron which appeared in the Dec. 4 issue.

Normally, we do not take issue with your good magazine but in this instance we would like to comment on several paragraphs.

Our firm was probably one of the first to begin experimental work with ductile iron in the United States. As far back as 1947 we made up a sizable lot of ductile iron well casing which was shipped to an oil firm in Texas.

We have furnished several hundred thousand feet, aggregating several thousand tons per year, for the past three years. This material has mainly been for gas, but has run the gamut of many pipe products.

We are mailing you our recently published booklet on American Ductile Iron, which will give you some insight into our operations to date.—J. W. MacKay, Vice Pres.-Sales, American Cast Iron Pipe Co., Birmingham.

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2. *Single flanged inner race; separator; retaining rings in outer race.*
3. *Double flanged outer race; bronze separator; single flanged inner race.*
4. *Double flanged inner race; straight outer race; bronze separator.*
5. *Straight inner race; double flanged outer race; bronze separator.*
6. *Double flanged inner race; single flanged outer race; retainer on opposite side; non-separable; steel retainer.*
7. *Double flanged inner race; single flanged outer race, retainer on opposite side; non-separable; full roller, no separator.*

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## Man in the Middle

Is it possible to get an objective but still informed analysis of the national labor climate, and the pressures creating it?

The two don't go hand in hand. Most of the informed people we know on labor issues are active from either the union or management side. And they aren't likely to be objective these days.

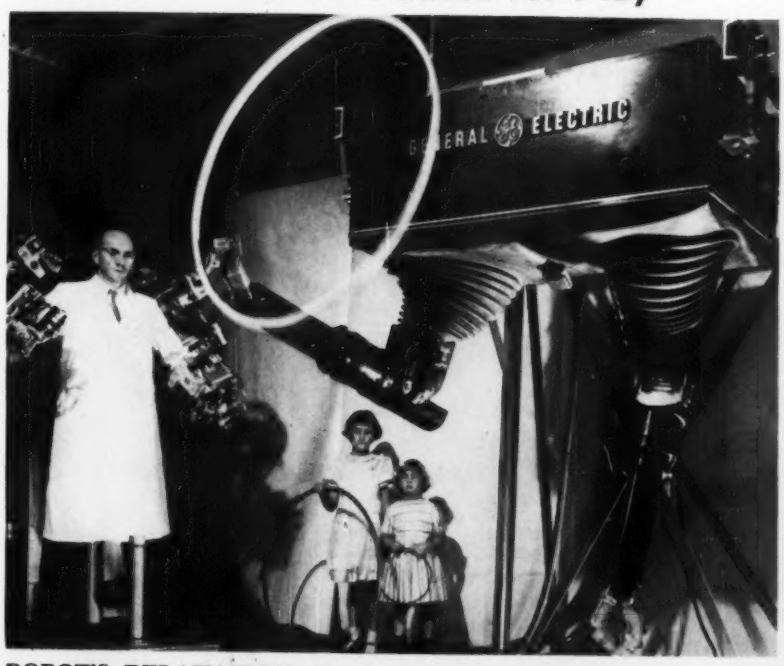
But one of the most informed people on labor questions in the country has to be objective. He is Joseph F. Finnegan, Director, Federal Mediation and Conciliation Service.

**The Peacemakers**—Last year his staff of 210 mediators actively mediated 6490 labor disputes. As Mr. Finnegan says, his service is "sometimes referred to as industrial peacemakers. We do the same thing in labor relations that Ralph Bunche and Dag Hammerskjold do in international relations—try to get the parties to sit down and reach a mutually satisfactory agreement before stepping into the alley to battle it out."

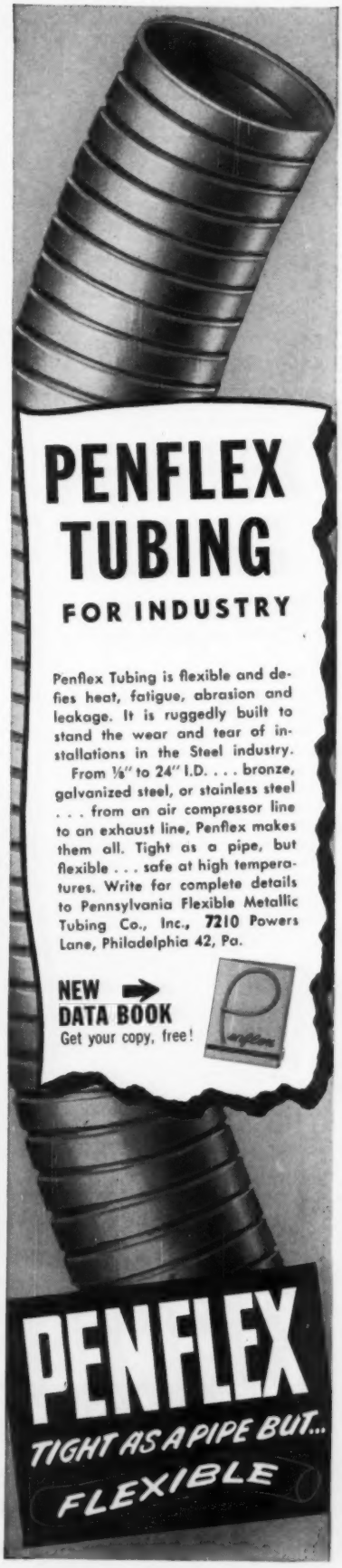
To get Mr. Finnegan's analysis of the labor climate for 1959, we asked him key questions. His answers are complete, informed and provocative.

We think our interview with Mr. Finnegan, starting on p. 67, is something every management man who works or deals with organized labor should read—and then lend to his union friends.

## Mechanical Marvel Pauses for Play




**ROBOT'S RELAXATION:** Handyman—General Electric's new hydromechanical master-slave—goes in for a bit of hula hooping while visiting youngsters watch. Afterwards he'll be sent to work behind seven-foot-thick concrete walls handling radioactive objects in GE's Aircraft Nuclear Propulsion Dept. at AEC's National Reactor Testing Station. Handyman makes use of clutching motion of the human hand, can be equipped to "see" via three-dimensional television.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TUBING
FOR INDUSTRY
Penflex Tubing is flexible and defies heat, fatigue, abrasion and leakage. It is ruggedly built to stand the wear and tear of installations in the Steel industry.
From ⅛" to 24" I.D. . . . bronze, galvanized steel, or stainless steel . . . from an air compressor line to an exhaust line, Penflex makes them all. Tight as a pipe, but flexible . . . safe at high temperatures. Write for complete details to Pennsylvania Flexible Metallic Tubing Co., Inc., 7210 Powers Lane, Philadelphia 42, Pa.
NEW
DATA BOOK
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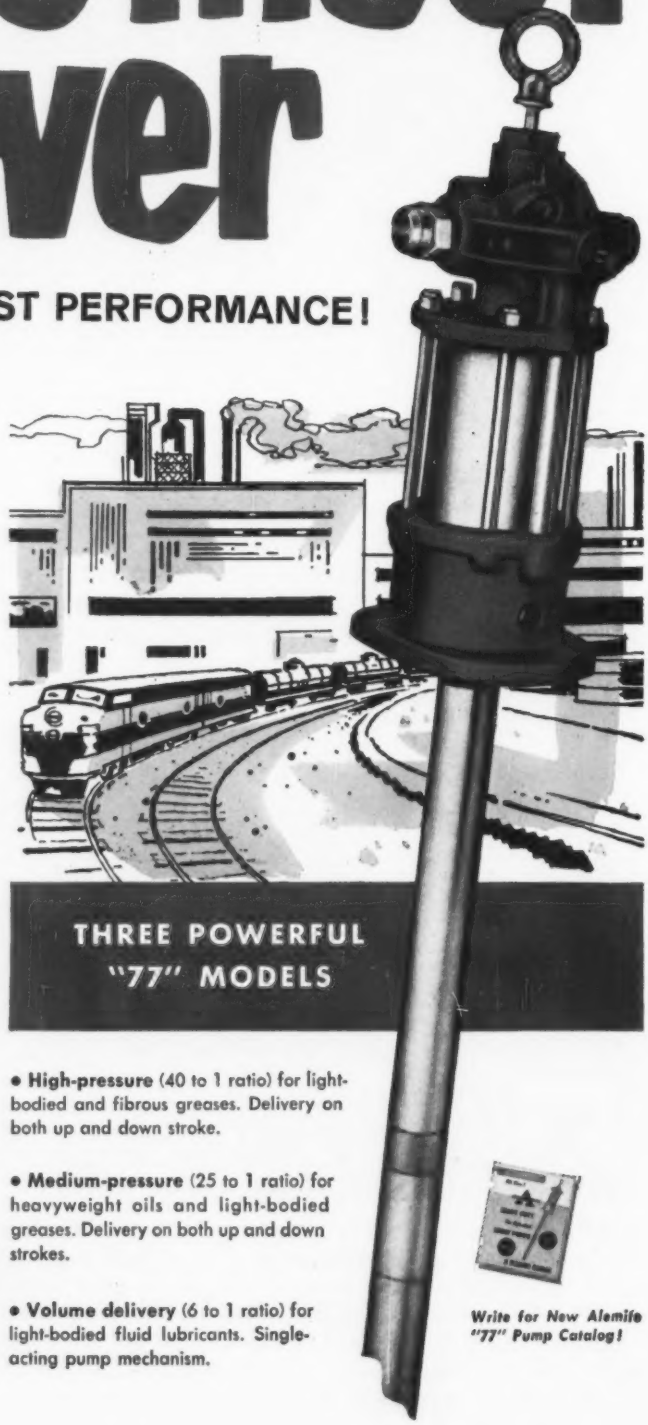
PENFLEX
TIGHT AS A PIPE BUT...
FLEXIBLE

## ALL-NEW ALEMITE "77" LUBRICANT PUMP

# packs most power

### FOR HIGHEST PERFORMANCE!



**68% More Powerful** . . . outperforms any other air-operated lubricant pump of its class on the market today! The all-new 5.2 horsepower Alemite "77" Pump assures smoothest, fastest delivery of all lubricants, through longest lines!

**Three Master Pressure Ratios** for unequalled delivery of all lubricants – fluid, semi-solid and heavy fibrous types. Lightweight, rust-proof aluminum construction.

**Precision Engineered** from finest quality materials–designed for outstanding ease of operation and maximum performance. Models for 120-lb. or 400-lb. drums – for all industrial applications.

### All-New Alemite "77" Features!

• **Volume Air Distributing Valve**—self-seating, self-cleaning, volume porting • **Modern-Design, Highly Efficient Toggle Trip Mechanism** provides balanced pressure on shuttle . . . won't bind • **Straight-Line Exhaust** has extra-large port for highest pump efficiency • **Hardened Steel Piston and Cylinder,** lapped to a precision fit of 125 millionths of an inch • **All-Steel Primer Valve,** ground to a perfect seal . . . hardened for abrasion resistance • **Dynamic Primer** assures priming and pumping of heaviest lubricants.

### THREE POWERFUL "77" MODELS

• **High-pressure** (40 to 1 ratio) for light-bodied and fibrous greases. Delivery on both up and down stroke.

• **Medium-pressure** (25 to 1 ratio) for heavyweight oils and light-bodied greases. Delivery on both up and down strokes.

• **Volume delivery** (6 to 1 ratio) for light-bodied fluid lubricants. Single-acting pump mechanism.



*Write for New Alemite "77" Pump Catalog!*

Symbol of SW Excellence

**ALEMITE**
DIVISION
**STEWART-WARNER**
**CORPORATION**

Dept. G-49, 1850 Diversey Parkway, Chicago 14, Illinois

## COMING EXHIBITS

**Engineered Castings Show** — Apr. 13-17, Sherman and Morrison Hotels, Chicago. (American Foundrymen's Society, Golf & Wolf Rds., Des Plaines, Ill.)

**Packaging Exposition**—Apr. 13-17, International Amphitheatre, Chicago. (American Management Assn., 1515 Broadway, N. Y.)

**Powder Metallurgy Show** — Apr. 20-22, Sheraton - Cadillac Hotel, Detroit. (Metal Powder Industries Federation, 130 W. 42nd St., New York 36.)

**Design Engineering Show** — May 25-28, Convention Hall, Philadelphia. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

**Material Handling Show** — June 9-12, Public Auditorium, Cleveland. (Hanson & Shea, Inc., One Gateway Center, Pittsburgh 22.)

**Industrial Finishing Show** — June 15-19, Detroit Artillery Armory, Detroit. (Information: H. J. McAleer, 3171 Bellevue, Detroit 7, Mich.)

## MEETINGS

### APRIL

**Copper & Brass Warehouse Assn.**—Annual convention, Apr. 12-15, De Monte Lodge, Pebble Beach, Calif. Association headquarters, Investment Bldg., N. W., Washington 5, D. C.

**National Assn. of Architectural Metal Mfrs.**—Annual convention, Apr. 12-17, Hotel Monteleone, New Orleans, La. Association headquarters, 228 N. LaSalle St., Chicago.

**Steel Shipping Container Institute, Inc.**—Annual meeting, Apr. 14-16, Kenilworth Hotel, Miami Beach, Fla. Institute headquarters, 600 Fifth Ave., New York.

**(Continued on P. 16)**

**ALABAMA**
**Birmingham**
Hinkle Supply Co., Inc.—FAirfax 2-4541

**CALIFORNIA**
**Los Angeles**
Meyer Sheet Metal Mchry. Co.—VAn Dyke 1477
**San Francisco**
Harron, Rickard & McCone Co.—ATwater 2-2202

**GEORGIA**
**Atlanta**
Allison Mchry. Co.—JAckson 4-1741

**INDIANA**
**Indianapolis**
E. L. Humston Co., Inc.—WAlnut 5-9691

**IOWA**
**Bonaparte**
Corry's Machine & Tool Co.—Phone: 112

**KANSAS**
**Wichita**
Elfeldt Mchry. & Supply Co.—AMherst 7-9773

**MASSACHUSETTS**
**Cambridge**
Austin-Hastings Co., Inc.—KIrkland 7-4480

**MICHIGAN**
**Detroit**
J. Lee Hackett Co.—TRinity 2-6442

**MINNESOTA**
**Minneapolis**
Minnesota Steel & Mchry. Co.—FEderal 3-6273

**MISSOURI**
**Kansas City**
Elfeldt Mchry. & Supply Co.—VIctor 2-5494

**NEW YORK**
**New York**
Federal Machinery Corp.—CAnal 6-3022
Triplex Machine Tool Corp.—EMpire 1-1700
H. Weiss & Co.—CAnal 6-4256

**NORTH CAROLINA**
**Greensboro**
Armentrout Mchry. Co.—Phone: 4-8218

**OHIO**
**Columbus**
Vorys Brothers, Inc.—AXminster 4-4701

**OKLAHOMA**
**Oklahoma City**
Hart Industrial Supply Co.—REgent 9-2541
**Tulsa**
Hart Industrial Supply Co.—LUther 3-2175

**OREGON**
**Portland**
Pacific Metal Co.—CApitol 7-0693

**PENNSYLVANIA**
**Philadelphia**
Delaware Valley Mchry., Inc.—OLdfield 9-4600
Milton Equipment Co.—WAlnut 2-1734
**Pittsburgh**
Wm. K. Stamets Co.—ATlantic 1-8091

**TEXAS**
**Dallas**
Briggs-Weaver Mchry. Co.—LAkeside 8-0311
**Fort Worth**
Briggs-Weaver Mchry. Co.—EDison 6-5621
**Houston**
Mehl Machinery, Inc.—FAirfax 3-1313

**WASHINGTON**
**Seattle**
Pacific Metal Co.—MAin 6925

**WISCONSIN**
**Milwaukee**
Production Equip. Inc.—GReenfield 6-6075

**CANADA**
A. R. Williams Machinery Co., Ltd.

**ALBERTA**
**Calgary**—Phone: 5-4425
**Edmonton**—Phone: 24341

**BRITISH COLUMBIA**
**Vancouver**—TAtlow 9411
**Victoria**—Phone: 4-7623

**MANITOBA**
**Winnipeg**—SPruce 4-4458

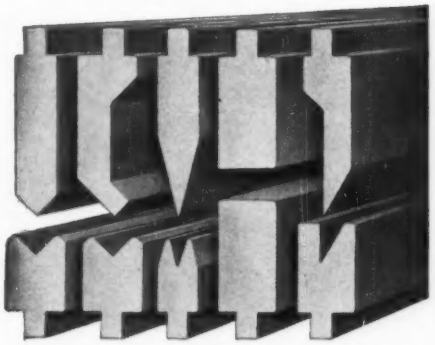
**NOVA SCOTIA**
**Halifax**—Phone: 5-4389

**ONTARIO**
**Hamilton**—JAckson 9-5388
**Ottawa**—CEntral 6-3661
**Toronto**—EMpire 4-2381
**Windsor**—CLearwater 4-4762

**QUEBEC**
**Montreal**—Riverside 8-9381

8925


# Off-the-shelf DELIVERY



# CHICAGO®
## *Induction Hardened**
# PRESS BRAKE DIES

This organization of local distributors offers immediate delivery on many CHICAGO *induction hardened* press brake dies. These stock dies are economical, and the quick delivery saves time in tooling. They are available in any length from 4 to 12 feet in increments of 2 feet.

Stock dies are used for a surprisingly large variety of bending operations. And, with CHICAGO *induction hardened* dies you get bonus performance and increased die life at no extra cost. Remember, these dies can be used in any make or size of standard press brake.

On your needs for press brake dies, call your nearest distributor listed here. With Bulletin D-457 you can order by number. Ask for a copy.

*Induction hardening is a special, high-frequency process used to harden the wear surfaces of CHICAGO dies. Field reports on CHICAGO *induction hardened* dies show up to ten times longer life than conventional press brake dies.

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*Press Brakes, Press Brake Dies*
*Straight-Side-Type Presses*

*Hand and Power Bending Brakes*
*Special Metal-Forming Machines*

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**MANUFACTURING CO.**
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Chicago 36, Illinois

A-W Hydraulic Crane quickly and easily removes this 6000-lb.-engine and propeller assembly on a Delta Air Lines DC-7.

# Versatile Austin-Western Hydraulic Crane speeds aircraft engine changes . . . saves Delta 1000 man-hours yearly

Delta selected the Austin-Western Hydraulic Crane as the outstanding materials handling machine to meet its exacting requirements for maneuverability and load, reach and boom clearance capacities.

**Maneuverability important**

All-wheel drive and all-wheel steering make the A-W 5-ton crane, with basic 18-ft. telescoping boom, a highly versatile piece of materials handling equipment.

In providing periodic inspection, maintenance and overhaul on its fleet of 73 aircraft, ranging from Super Convairs to DC-6, DC-7 and DC-7B's, Delta changes an average of more than 50 engines each month. It is estimated that use of the A-W crane saves 1000 man-hours annually on engine and propeller changes alone!

To Delta, the biggest single advantage of the A-W crane is its maneuverability around parked aircraft, maintenance stands and equipment. With all-wheel steering, the A-W can make a 90° turn in less radius than its own length. The boom rotates a full 360° for fast front, rear or over-the-side pickup or unloading.

**A dependable precision tool**

A-W dependability makes work scheduling easier, speeds aircraft back to operational status. Delta has discovered many uses for this all-purpose hydraulic crane in its operations. It is a precision tool that does work faster and easier, with less operator fatigue.

Learn now why men responsible for materials handling everywhere are so enthusiastic about this hardworking new hydraulic crane. See your nearby A-W distributor or write us today for complete information.

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BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes


## EXHIBITS, MEETINGS

(Continued from P. 15)

**National Petroleum Assn.**—Semi-annual meeting, Apr. 15-17, Cleveland Hotel, Cleveland. Association headquarters, Munsey Bldg., Rm. 958, Washington 4, D. C.

**Association of Roller & Silent Chain Manufacturers**—Spring meeting, Apr. 16-17, Drake Hotel, Chicago. Association headquarters, 3343 Central Ave., Indianapolis.

**American Institute of Steel Construction, Inc.**—National engineering conference, Apr. 16-17, The Dinkler - Tutwiler Hotel, Birmingham, Ala. Institute headquarters, 101 Park Ave., New York.

**American Society of Tool Engineers**—Annual meeting, Apr. 18-22, Schroeder Hotel, Milwaukee. Society headquarters, 10700 Puritan Ave., Detroit 38.

**Metal Powder Industries Federation**—Annual meeting, Apr. 20-22, Sheraton Cadillac Hotel, Detroit. Federation headquarters, 130 W. 42nd St., New York 36.

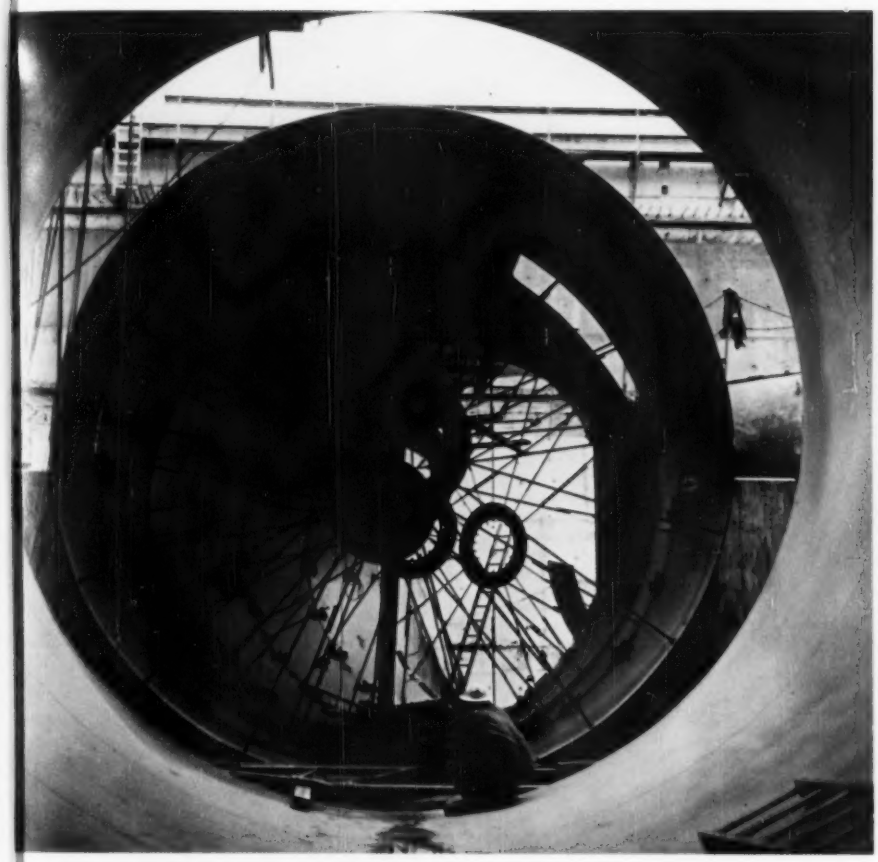
**American Society of Lubrication Engineers** — Annual meeting and lubrication exhibit, Apr. 21-23, Hotel Statler, Buffalo, N. Y. Society headquarters, 84 E. Randolph St., Chicago.

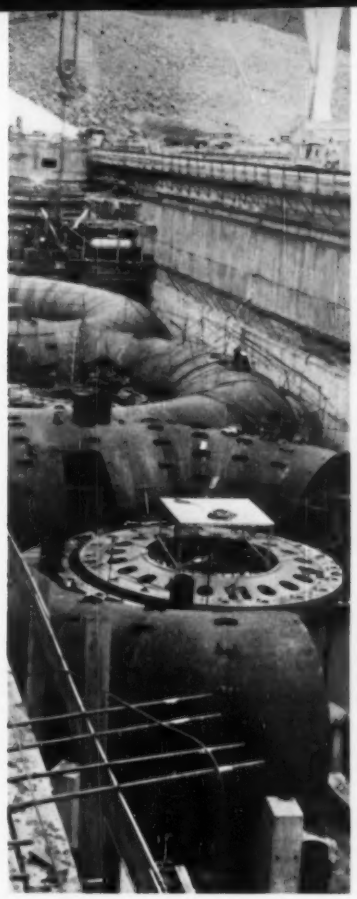
**Lead Industries Assn.** — Annual meeting, Apr. 22-24, The Drake Hotel, Chicago. Association headquarters, 60 E. 42nd St., New York.

**American Zinc Institute, Inc.**—Annual meeting, Apr. 23-24, Drake Hotel, Chicago. Institute headquarters, 60 E. 42nd St., New York.

**Wire Assn.** — Regional meeting, Apr. 23-24, Statler Hotel, Boston. Association headquarters, 453 Main St., Stamford, Conn.

**Metal Treating Institute** — Spring meeting, Apr. 23-25, Hollywood Beach Hotel, Hollywood, Fla. Institute headquarters, 271 North Ave., New Rochelle, N. Y.





**Good fabrication and welding properties** of "T-1" Steel saved time and money in the shop and on location.

**24 feet in diameter**—the nation's largest turbine scroll cases. Built with USS "T-1" Steel for maximum strength with least weight.

# Biggest turbine scroll cases built 50% lighter with USS "T-1" Steel

A turbine scroll case looks like a giant seashell. Through the conch, water gushes in an ever-tightening spiral into the blades of the water turbine. Pressures are enormous.

Four of these cases, the largest in the United States, have been fabricated from USS "T-1" Constructional Alloy Steel by the Chicago Bridge & Iron Company. They will harness the flow of the Clark Fork River in the Noxon Rapids Dam, a project of the Washington Water Power Authority.

USS "T-1" Steel was used for the cases because of its high minimum yield strength of 90,000 psi. (100,000 psi for non-code applications.) This permitted a reduction in plate thickness of about 50% with sizeable savings in welding costs, freight and foundation costs. Welding on the job was readily done and there was no need for stress relieving.

**What USS "T-1" Steel can do for you.**

USS "T-1" Steel is an extra strong, tough, weldable steel with high resistance to impact abrasion and corrosion. Both mobile and stationary equipment can be built bigger, stronger and more durable. Payloads can be increased and operating costs drastically reduced. Your products are worth more because they do more and save more when built of USS "T-1" Steel. For information about USS "T-1" Steel, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

*USS and "T-1" are registered trademarks*

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

**United States Steel**

USS

## Down go back-up roll costs with

# Quality Forged Sleeves

PICTURED ABOVE is James S. Rennick, a metallurgist with twenty years' experience in the Forgings Division of U. S. Steel. Jim specifies composition, heat treatment, and other processing procedures essential to the production of assemblies as shown in the main picture—a back-up roll that will be used in the cold reduction tin mill at U. S. Steel's Gary, Indiana plant.

This job points up a curious situation: U. S. Steel is one of the country's leading manufacturers of rolls, and also one of the biggest *users* of rolls . . . a double reason to perfect their performance and reduce their cost . . . just as we did here.

We had to replace a worn, cast steel back-up roll. Rather than replace the entire roll, we machined the face of the roll and shrunk on a *forged* steel sleeve. For back-up rolls like this one, 42″ O.D. and larger, this method of sleeving is much less expensive than buying a complete new roll. One arbor can be used for several forged sleeves. A forged sleeve has a hard, wear-resistant surface and is highly resistant to spalling.

Also, the sleeve is purposely produced with a softer bore to develop a desirable stress pattern, and to provide maximum gripping between the arbor and sleeve after assembly.

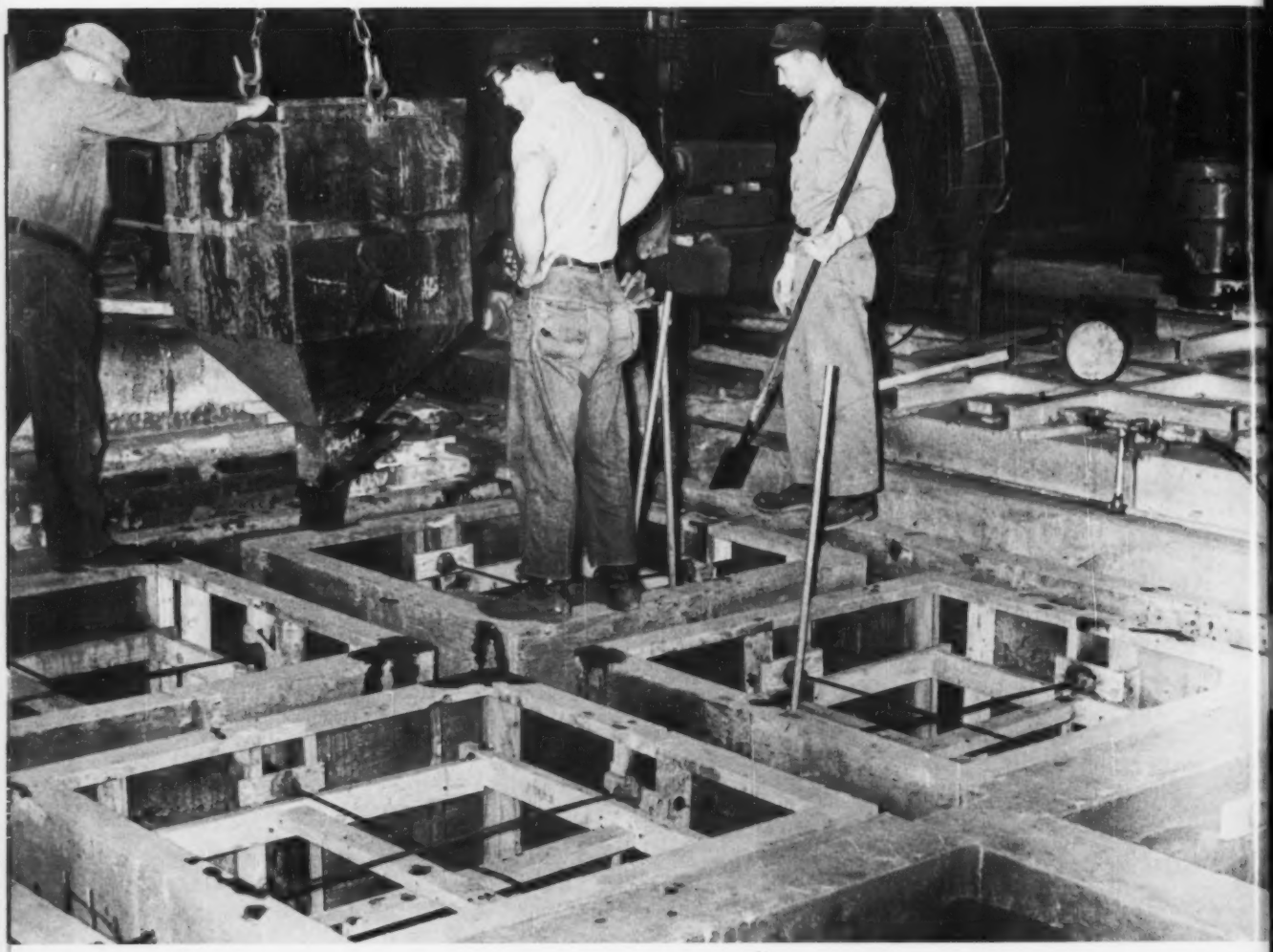
There is a good possibility that we can help reduce *your* roll costs. Write or call the United States Steel Office nearest you, or United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

*USS is a registered trademark*

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Export Company

**United States Steel**

# Slow-cooling pits cost less to build with refractory concrete made with Atlas Lumnite Cement



Vanadium-Alloys Steel Company, Latrobe, Pennsylvania, saved time and money by constructing slow-cooling pits with refractory concrete made with Lumnite calcium-aluminate cement. Using plant labor, 24 refractory concrete pits were formed in record time. With re-usable wood forms, material costs were greatly reduced. And procedures and equipment typical of any standard concrete construction work helped speed the job. The result was a smooth, jointless concrete pit that will resist thermal shock and wear and tear of charging and unloading hot alloy ingots.

For added convenience and economy in refractory concrete construction, castables made with Lumnite cement are available. These are packaged mixtures, ready for use. Simply add water, mix and place. Made by leading manufacturers of refractories. For more information, write Universal Atlas, 100 Park Avenue, New York 17, N. Y.

"USS," "Atlas" and "Lumnite" are registered trademarks

L-180

USS

**Universal Atlas Cement**
**Division of**
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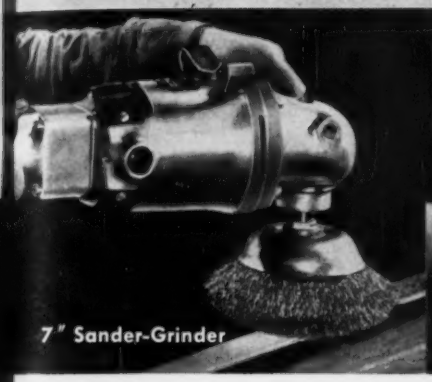
OFFICES: Albany · Birmingham · Boston · Chicago · Dayton · Kansas City · Milwaukee · Minneapolis · New York · Philadelphia · Pittsburgh · St. Louis · Waco

# PRODUCTION...CONSTRUCTION...MAINTENANCE



7" Sander-Grinder

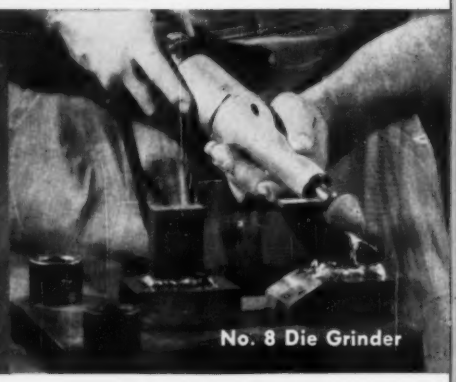
No. 12 Scrugun®

No. 11 Jig Saw

## whether the job's drilling, sanding, sawing,

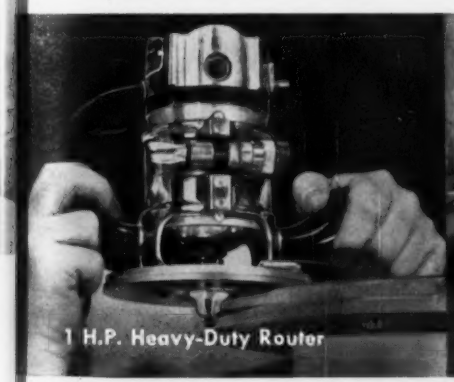
7" Super-Service Saw

No. 88 Finishing Sander

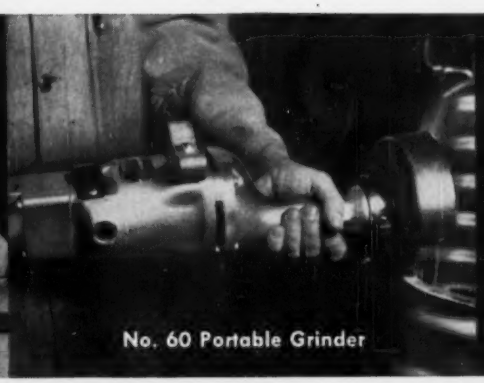


No. 8 Die Grinder

## fastening, grinding, bolting, chipping...



1 H.P. Heavy-Duty Router



No. 60 Portable Grinder

⅜" Standard Holgun®

# Black & Decker® tools cut your costs!

Save time whenever you need a portable electric tool . . . simply call your local Black & Decker distributor. He stocks over 125 tools and 3,000 accessories to give you complete selection, fast delivery, tool know-how and personal service. Or, for complete tool information mail coupon at right.

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☐ Tapguns®

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☐ Belt Sanders

☐ Hammers

## Martin P6M SeaMaster employs Republic Titanium

# FOR STRENGTH, HEAT-RESISTANCE, WEIGHT-SAVING

The P6M SeaMaster is being built for the Navy by The Martin Company, Baltimore, Maryland. The attack seaplane is designed for minelaying and photo-reconnaissance. Photo shows a titanium center beam used in each engine nacelle.

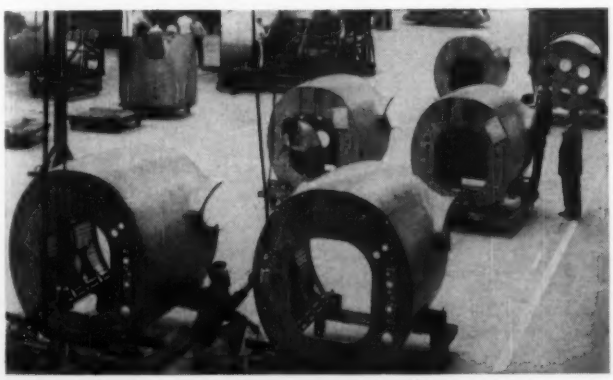
Two factors enabled The Martin Company to smooth the way for rapid, economical transition from design and development to production and delivery of the SeaMaster. First, was far-sighted planning on the prototype. Second, was utilization of the latest engineering principles, production concepts, and materials, including Republic Titanium.

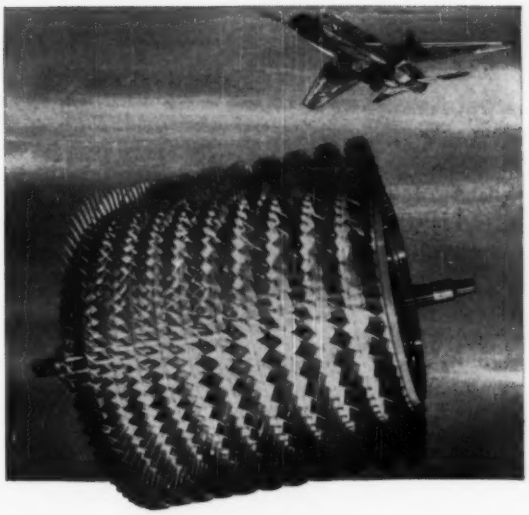
Employing commercially pure titanium and titanium alloys, the SeaMaster contains more than 500 titanium details. The largest is a formed sheet metal bulkhead measuring 30″ by 45″—probably the largest detail ever formed from titanium at the time it was produced.

Commercially pure titanium and titanium alloy types supplied by Republic are used for strength, heat-resistance, and weight-saving. The titanium alloys are among the strongest now being produced and offer high strength values at elevated temperatures. In fact, titanium alloys provide the highest strength-to-weight ratio of any construction metal.

Many types of metals are required to meet the varied requirements of both aircraft and missile manufacturers. Metals to resist heat and corrosion, to reduce weight, to add strength. Production of these flight weight metals is a Republic specialty.

Republic metallurgists and engineers are always available to work with your personnel in developing the most advantageous use of Republic Titanium, Stainless Steels, and Alloy Steels. The coupon is your invitation to use this obligation-free service.





**REPUBLIC ALLOY FORGING STEELS** meet designers' requirements for operating and structrual parts that must be free from excess weight, yet tough and strong to withstand shock, impact, stress, and fatigue. In these quality steels are found the highest strength values—plus an exceptionally high strength-to-weight ratio that permits the use of thinner, lighter sections to save weight and hold down size without sacrifice of strength or safety. These essential qualities were the basis for selection of Republic Hot Rolled AMS 6415 (AISI 4340) for compressor rotor discs in jet engines. The discs are machined from forgings by the Tapco Group, Thompson Ramo Wooldridge Inc. Forgings were supplied by Wyman-Gordon Company.

**REPUBLIC ENDURO STAINLESS STEELS,** Types 301 and 302, are used by Solar Aircraft Company in fabricating complete nacelles for Navy P2V patrol bombers. Stainless construction offers a number of advantages including less maintenance for protection against corrosion, greater strength, ability to withstand high temperatures, the use of lighter gages to save weight. These types are readily formed into desired shapes by the usual commercial methods.

# REPUBLIC STEEL

*World's Widest Range of Standard Steels and Steel Products*

**REPUBLIC STEEL CORPORATION**
**DEPT. IA -7273**
**1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO**

Have a metallurgist call:
☐ Titanium ☐ Stainless Steel ☐ Alloy Steel

Send more information on:
☐ Titanium ☐ Stainless Steel ☐ Alloy Steel

Name_____ Title_____

Company_____

Address_____

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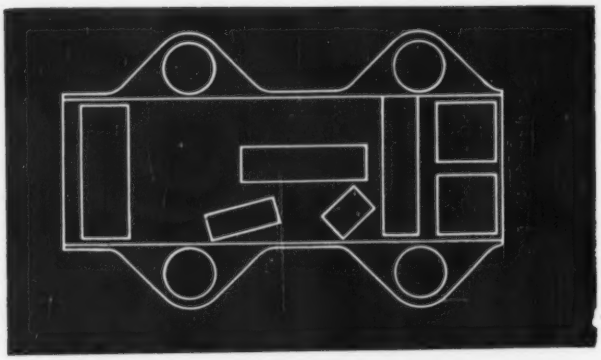
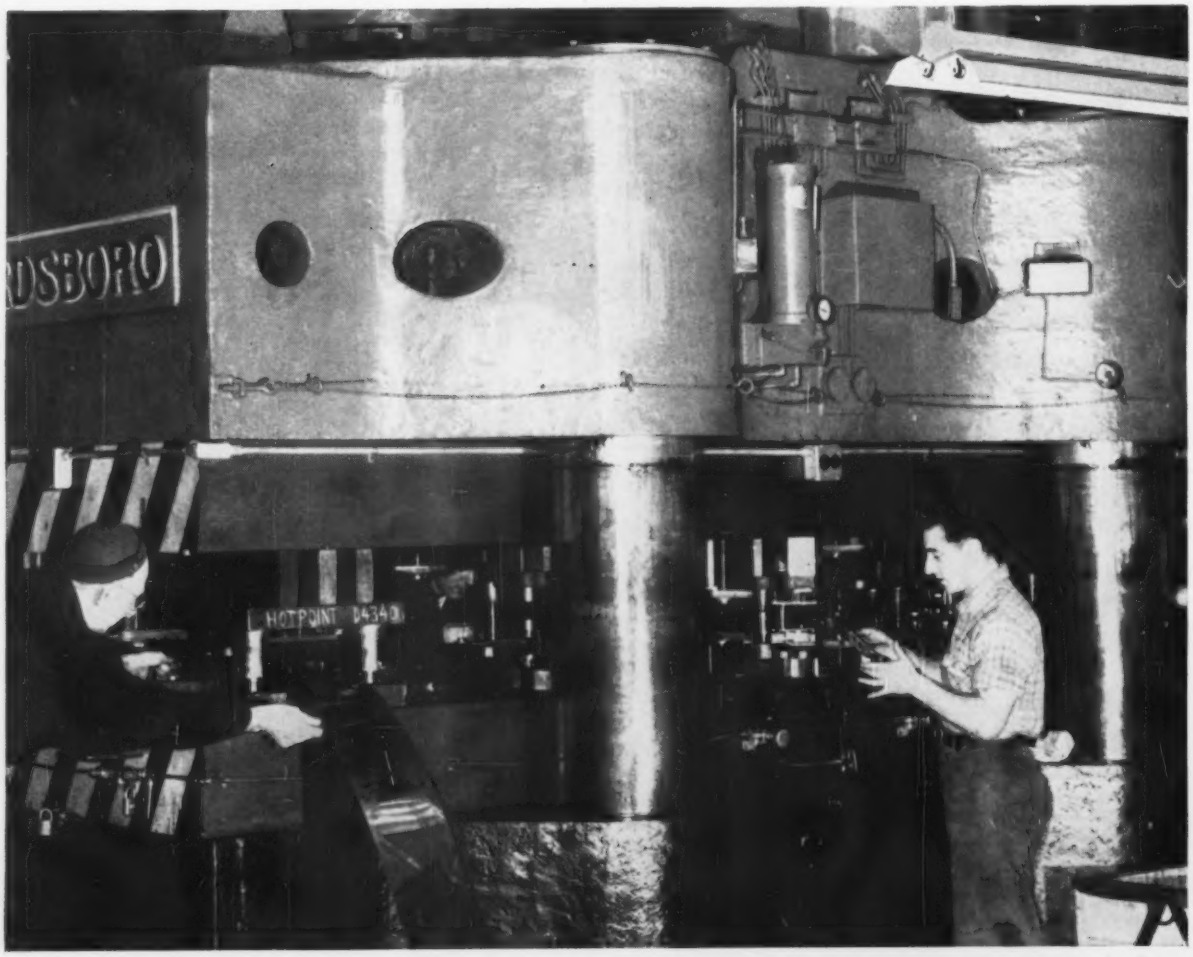
**BIRDSBORO**

*Hydraulic Presses are designed for versatility and profitable operation*



● This single 2000-ton capacity Birdsboro press can perform blanking, piercing, trimming, and embossing operations at one time on its 60 sq. ft. of die space. This saves handling of parts, cuts labor costs and eliminates the need for individual presses for each operation. BIRDSBORO designs versatility into each press produced. For more detailed information call in your BIRDSBORO representative. *Sales Department:* Reading, Pa., *Engineering Department and Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.




BIRDSBORO HYDRAULIC

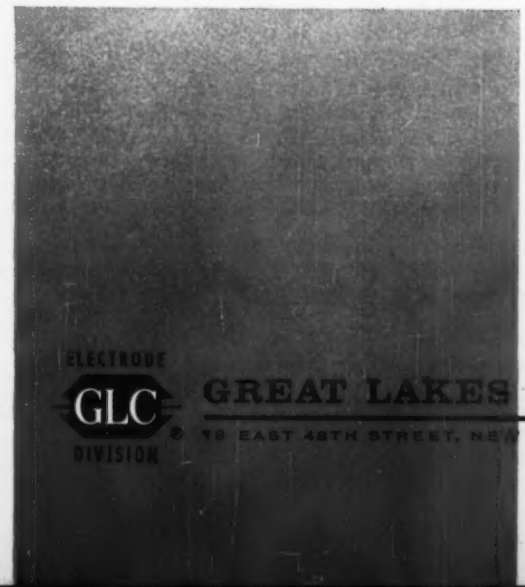
**BIRDSBORO**
**STEEL FOUNDRY AND MACHINE CO.**

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel

# IN THE FINAL ANALYSIS

• • • the superior quality of an electrode is a major factor in lowering the per-ton cost of electric steels.

PRODUCTS ELECTRODE GLC DIVISION YOU CAN TRUST



ELECTRODE GLC DIVISION

GREAT LAKES CARBON CORPORATION

18 EAST 48TH STREET, NEW YORK 17, N. Y. OFFICES IN PRINCIPAL CITIES

# "Dad believes in good guns and good gun manners"

*"He just bought me a new gas-powered Hahn BB rifle. It's real sharp and shoots straight, but he won't let me use it alone until I've learned good gun manners."*

Hahn BB guns, styled after famous lever-action Western frontier rifles, have the look and feel of Dad's guns—and they shoot straight. This is due to the accuracy of the barrels. They are made from commercial grade Superior carbon steel tubing —known for the consistent uniformity of its ID finish, free machining characteristics and economy.

**Examples of other unusual applications of this Superior tubing**

- Carbon steel rectangular tubing for collimating tubes in a research reactor (.900 in. x .400 in. ID x .025 in. wall in 10-ft. cuts)
- Specially conditioned ID tubing in long lengths used as high pressure diesel lines on earthmoving equipment (¼ in. OD x .088 in. ID)
- Cadmium plated compression sleeves for connecting the steel core of ACSR high tension cable (.404 in. OD x .179 in. ID in 5-in. cuts)
- 2½ million ft. of carbon steel tubing in random lengths for the gear pinion in the timing fuse of artillery shells (.204 in. OD x .067 in. ID)

Filling tubing orders that range from a few feet to millions, in a wide variety of materials, shapes and sizes, calls for the resources Superior has to offer. Why not investigate the advantages of using us as a source of tubing. Bulletin 41, a guide to the selection and application of Superior tubing, is yours for the asking. Write Superior Tube Company, 2004 Germantown Ave., Norristown, Pa.

**Superior Tube**

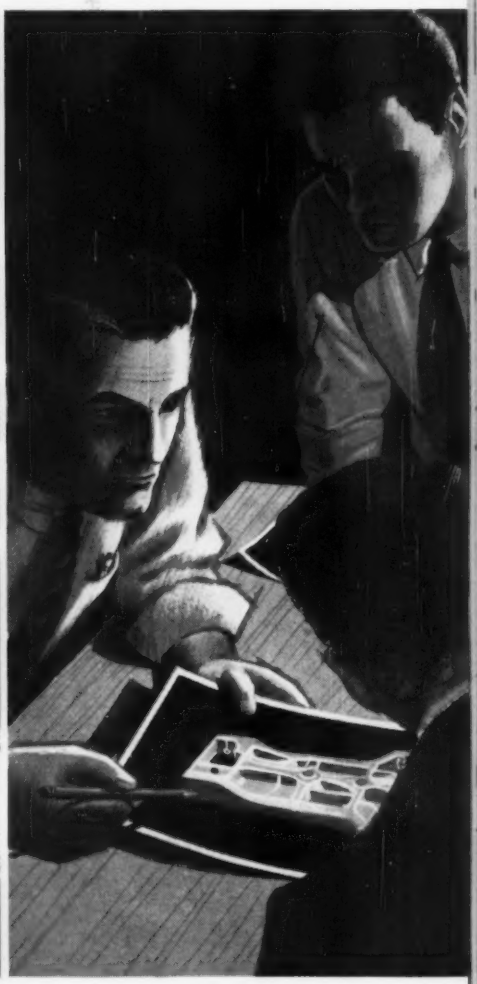
**The big name in small tubing**

**NORRISTOWN, PA.**

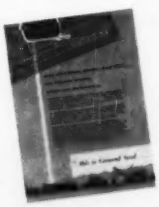
*All analyses .010 in. to ⅜ in. OD—certain analyses in light walls up to 2½ in. OD*

West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif. • RAymond 3-1331

*...where industrial progress is cast in steel*



## DESIGN ENGINEERING...SERVICE IN DEPTH



Write for folder—
**How General Steel Castings Can Improve Product Design and Performance.**
General Steel Castings, Station 201
Granite City, Illinois

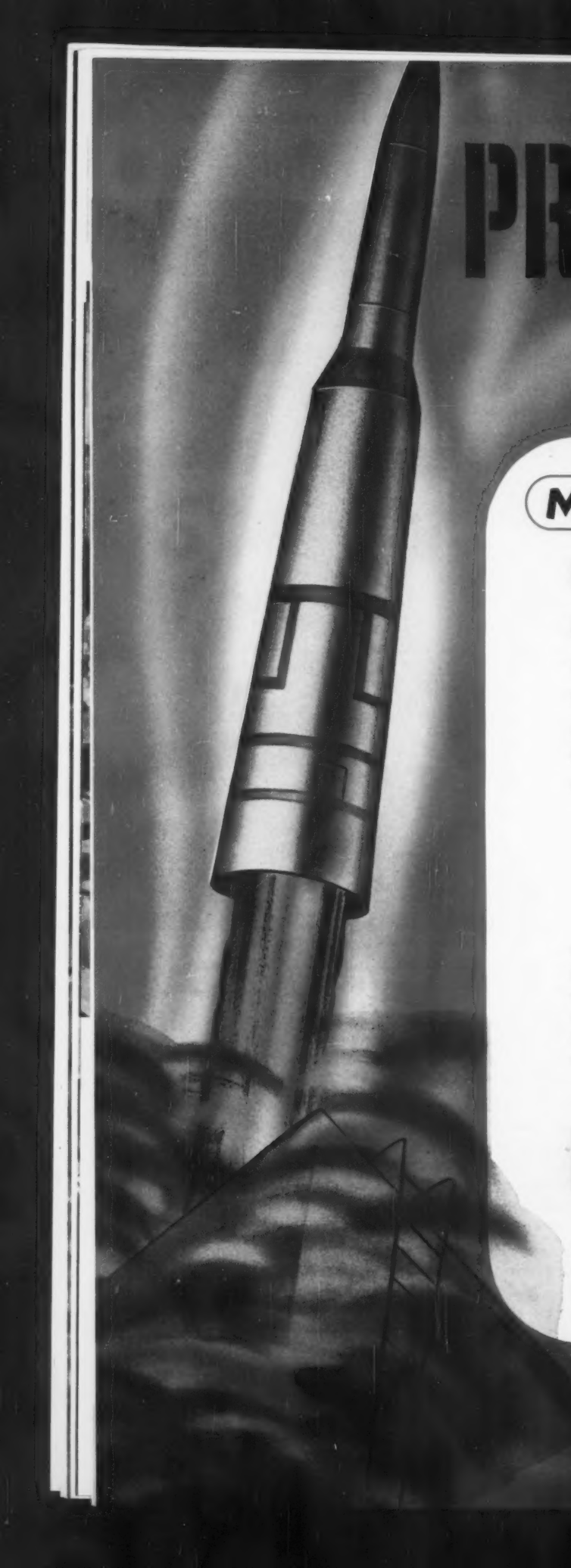
The broad scope of General Steel's design engineering department is unique in the industry. The department is well-staffed with experienced personnel skilled in design, stress analysis, testing and development work. This unified group complements the complete service offered by General Steel.

The design section alone contains many groups of specialists. In addition, you can draw upon the technical knowledge of the stress analysis group; the experimental group, with all necessary equipment and facilities to conduct static and dynamic testing; and the development group, which provides engineering services on special projects. These facilities can be of substantial benefit to you in developing cast steel structures and steel castings used in cast-weld and composite structures for your products.

Our complete services range from creative analysis of your product components in the "raw idea" stage . . . to follow-through on performance in the field. We prefer to team up with you from the start . . . for in this way you can take full advantage of our many specialized talents.

# GENERAL STEEL CASTINGS

GRANITE CITY, ILL. — EDDYSTONE, PA. — KANKAKEE, ILL.



# PROTECTION

**MEX-R-CO**

## PROTECTION

### *For Extreme Erosion and Abrasion*

Where a high-strength, high-purity, volume-stable refractory material is required, MEX-R-CO Refractory Castable products will meet the most severe service conditions. All MEX-R-CO Castables are scientifically developed and job-matched for protection-in-depth application.

- **KEEP UNITS ON-THE-LINE-LONGER**
- **INCREASE PRODUCTION**
- **REVERSE RISING REFRACTORY COSTS**

Use MEX-R-CO Castables for these Applications

**Blast furnace linings . . . Auxiliaries (lines, goosenecks, etc.) . . . Blast furnace packing . . . Dust collectors . . . Flues . . . Soaking pit covers and walls . . . Coke ovens . . . Refinery units (catalytic crackers, reactors, reformers, fluid cokers, and lines) . . . Carbon black furnaces (reactors, etc.) . . . Desulphurizing units . . . Special chemical reactors Jet strips and launching pads.**

COMPLETE SPECIFICATIONS for installing and maintaining MEX-R-CO Refractory Castable products will gladly be sent on request. Booklet covers Selection, Water Content, Mixing, Placement, Gunning, Anchoring, Finishing, Curing, Drying and Firing.

**MEXICO**

**REFRACTORIES COMPANY**

**MEXICO, MISSOURI**

# IN DEPTH!

## FOR TEMPERATURES FROM 700°F TO 3600°F

**MEX-R-CO**

## PROTECTION

### *Under These Service Conditions*

1. **Velocities of 130-feet, and above, per second, in dilute phase lines**
2. **Velocities above 8-feet per second in dense phase lines, or in dust collectors**
3. **Turbulent flows — or blasts**
4. **Coarse grain catalyst, equilibrium coke, or sinter dust**
5. **Abrupt change in direction or any combination of the above conditions**
6. **High production cyclones and similar areas**

MEX-R-CO service-proven, extreme erosion- and abrasion-resistant castables are high in purity, extra strong . . . and easy-to-apply. Service performance records indicate it is important to select the RIGHT Castable in the beginning and avoid the high cost of early repair and replacement. It does not cost more to employ the best. In-service time should be the deciding factor. For "Protection-in-Depth" use and specify MEX-R-CO Refractory Castables.

LO-ERODE

PURO-TAB

ACITAB

B F CASTABLE

PUROCAST

K-234-S

PAK (Blast Furnace Packing)

**STANDARD HEAVYWEIGHT AND LIGHTWEIGHT INSULATING CASTABLES**

NILES FIRE BRICK DIV. — Niles, Ohio
NATIONAL REFRACTORIES DIV. — Philadelphia, Pa.
BIG SAVAGE REFRACTORIES DIV. — Frostburg, Md.
*Canadian Division Office:* Hamilton, Ontario, Canada

This coupon will bring complete technical data on MEX-R-CO Refractory Castable Products. No obligation.

**MEXICO REFRACTORIES COMPANY**
**MEXICO, MISSOURI**

Send complete information on Refractory Castable products for installation in (Type of Unit)

Have your engineer contact us.

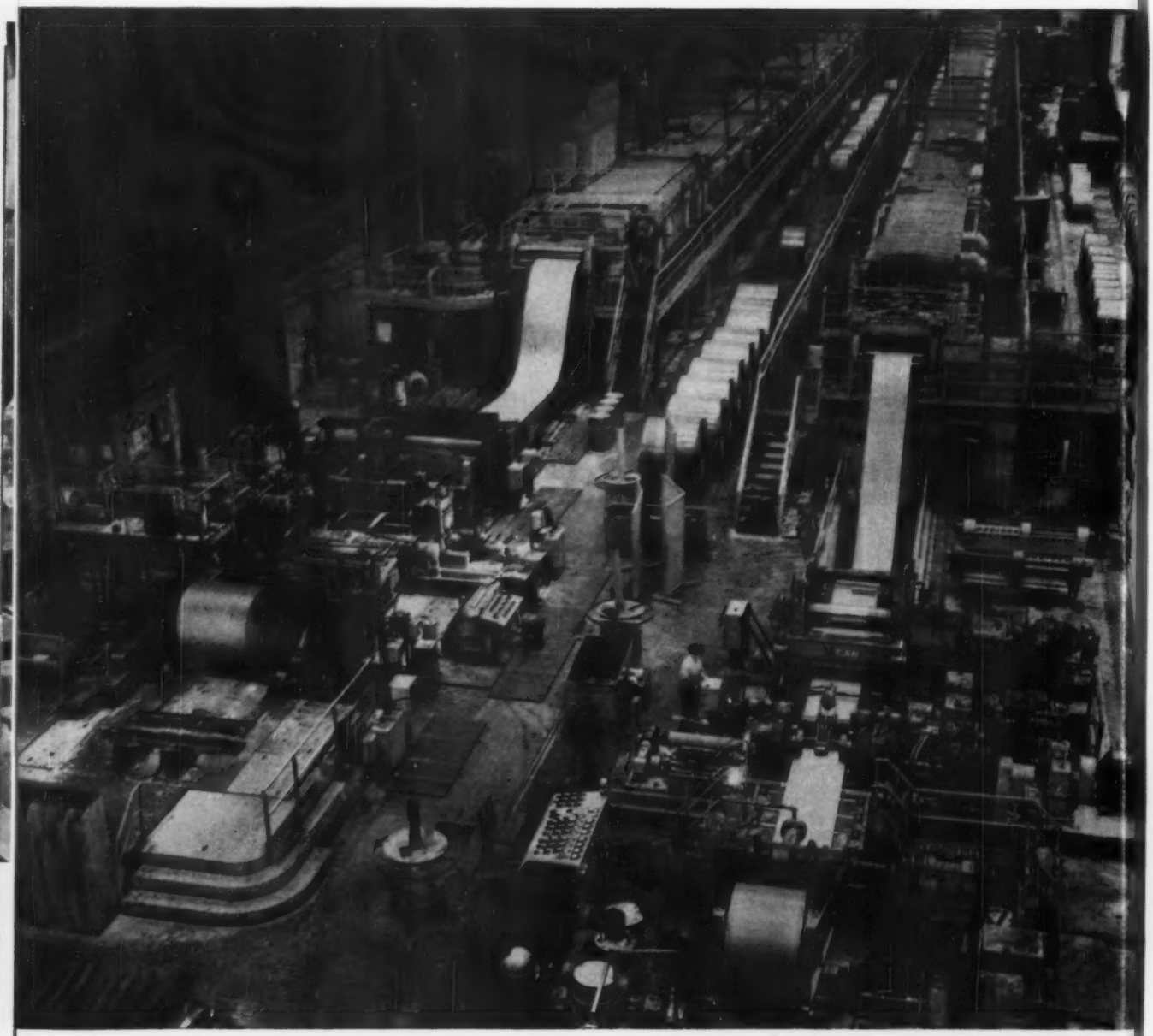
NAME

COMPANY

ADDRESS

*At Cleveland Works Division of the Exciting New J&L...*

# Wean lines give "finishing touch"



Wean 80" and 56" Continuous Strip Pickling Lines.

## *Quick facts on Wean processing equipment at J&L, Cleveland:*

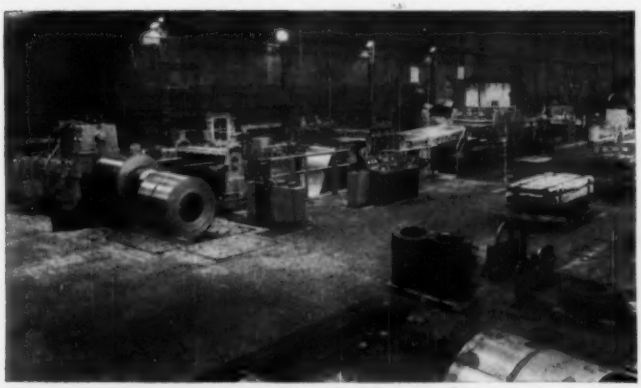
- **80" Continuous Pickling Line:** max. exit coil wt.—60,000#; strip thickness—.060" to .188"; line speeds—1000 FPM (entry end), 375 FPM (tanks and exit end).
- **56" Continuous Pickling Line:** max. exit coil wt.—50,000#; strip thickness—.060" to .250"; line speeds—1200 FPM (entry end), 500 FPM (tanks and exit end).
- **54" Cold Rolled Shear Line:** max. coil wt.—60,000#; strip thickness—.025" to .060"; sheet lengths—30" to 180"; line speed—800 FPM.
- **80" Cold Rolled Shear Line:** max. coil wt.—60,000#; strip width—24" to 72"; strip thickness—.012" to .0937"; sheet lengths—30" to 192"; line speed—300 FPM.
- **80" Hot Rolled Up-Cut Shear Line:** max. coil wt.—30,000#; strip width—24" to 75"; strip thickness—.375"; sheet lengths—48" to 500"; line speed—140 FPM.
- **80" Hot Rolled Flying Shear Line:** max. coil wt.—30,000#; strip width—18" to 75", thickness—.048" to .250"; sheet lengths—24" to 288"; line speed—350 FPM.

# to high-quality J&L Steel

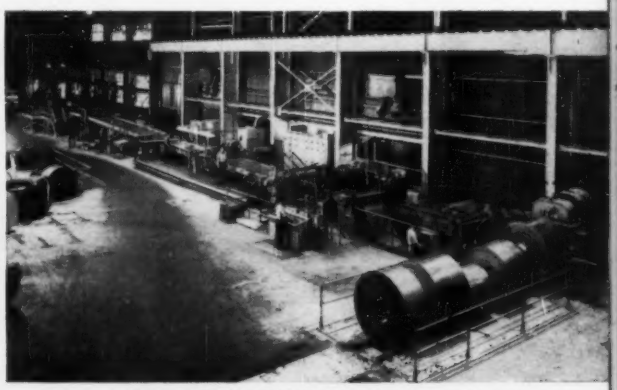
At these Jones & Laughlin facilities, Wean processing equipment plays an important role in the production of highest quality strip and sheet.

The 56″ and 80″ Wean continuous pickling lines efficiently remove scale from the strip prior to cold reduction. Four Wean shearing lines provide versatile combinations of shearing, recoiling, slitting, edge trimming and temper passing to produce sheet in a wide range of sizes and in thicknesses from .012″ to .375″ to suit every customer requirement.

The dependable, economical performance of these Wean installations typifies the advantages you can expect from Wean *creative engineering*—whatever your requirements for continuous steel processing lines.

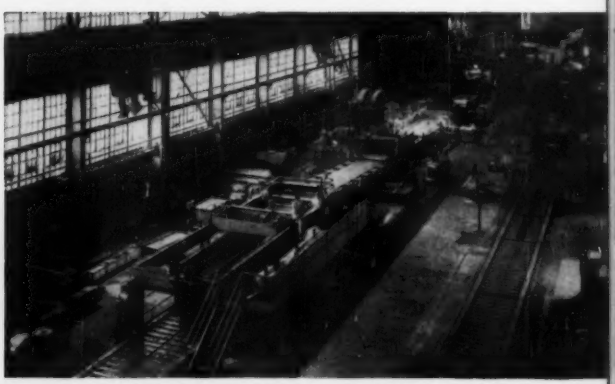


Wean 80″ Cold Rolled Strip Shear Line.



Wean 54″ Cold Rolled Strip Shear Line.

Two Wean 80″ Hot Rolled Strip Shearing Lines with McKay Processing Uncoilers.



Exit End—Wean 80″ Hot Rolled Shearing Lines (Flying Shear—left; Up-Cut Shear—right).

*Specialists in the design and construction of sheet, strip and tin plate processing lines . . .*

**THE WEAN ENGINEERING COMPANY, INC. • WARREN, OHIO**

# rigid specifications

Tension tests are required to be made at room temperatures and at 670° F. The following minimum physical properties shall be met:

At Room Temperature:

| TS | YS | EL | RA | CHARPY V-NOTCH |
|---|---|---|---|---|
| 70,000 | 30,000 | 45 | 50 | 50 |

At 670° F. the minimum tensile strength shall be 51,000 p.s.i. and the minimum yield strength 18,300 p.s.i.

**Rejection**

Each casting that develops unacceptable defects during shop working or fails to conform to all of the requirements of these specifications shall be rejected. No repair by welding or other means will be permitted.

Radiographic Inspection

(a) Paragraph S5 (a) of the Supplementary requirements of ASTM-A 362-52T.

(b) All castings shall be radiographed 100% and shall conform to ASTM-E7 1-52, Class 2 quality, except as modified by these specifications.

(c) The manufacturer shall establish a positive system of identification of the X-ray plates which shall be subject to approval by the inspector. This system shall guarantee complete coverage by radiographing and provide for positive identification between the plate and the subject.

Inspection of Penetrants

All castings shall be subjected to inspection by fluorescent penetrants or penetrating dyes both inside and out. All cracks, porosity, or flaws revealed as a result of the Dye Penetrant Test shall be due cause for rejection of the casting.

All cast pipe shall be hydrostatically tested to 5,900 p.s.i. and held at that pressure for 20 minutes with zero pipe leakage. Each length of pipe shall be hydrostatically tested at the manufacturer's plant.

The 304L stainless steel shall conform to the following ladle analysis:

| | | | |
|---|---|---|---|
| Carbon | .03 max. | | |
| Manganese | 1.50% max. | | |
| Phosphorous | .03% max. | | |
| Sulphur | .03% max. | | |
| Silicon | 2.00% max. | | |
| Chromium | 18.00 | - | 21.00% |
| Nickel | 8.00 | - | 11.00% |

**Pipe:** All pipe of the following sizes shall be centrifugally cast stainless steel as per ASTM-A 362-52T, except as modified by these specifications:

16" - Sch. #160
12" - Sch. #160
10" - Sch. #160
8" - Sch. #140

All pipe shall be machine finished to 125 micro-inch interior and exterior.

# for nuclear piping

# met by U.S. PIPE metal mold process

## Centrifugally Cast Stainless Steel Solves Many Piping Problems

Combinations of temperatures, pressures and corrosive conditions never encountered before: these are among the piping problems that must be overcome by the men who design the nation's nuclear power installations.

Stainless steel centrifugally cast pipe provides many of the answers. Study the specifications at the left . . . specifications demanded of stainless steel pipe on a recent job for Paul Hardeman, Inc., Los Angeles, California. This pipe is being used for heavy duty, high pressure, elevated temperature service in the primary piping system of the SPERT-III Reactor at the U. S. Atomic Energy Commission's National Reactor Testing Station near Idaho Falls, Idaho. The Stearns-Roger Mfg. Company, Denver, Colorado, is the architect-engineer on this project. A complete tabulation of the actual test data obtained on this pipe and to this specification is available upon request.

U. S. Pipe is headquarters for metal mold centrifugally cast alloy and stainless steel pressure pipe over a wide range of special and standard analyses—in large and small quantities—and to individual specifications.

If piping of the type described above is the bottleneck in your nuclear power planning, write and outline the problem.

**SIZE RANGE AND COMPOSITION FLEXIBILITY**

Outside Diameter—6" to 50"

Wall Thickness—⅜" and up

Length—Up to 16'

Types of Stainless—All Standard AISI and ACI grades of ferritic and austenitic stainless, including No. 20 Alloy, 17-4 P H, 17-7 P H and E.L.C. grades.

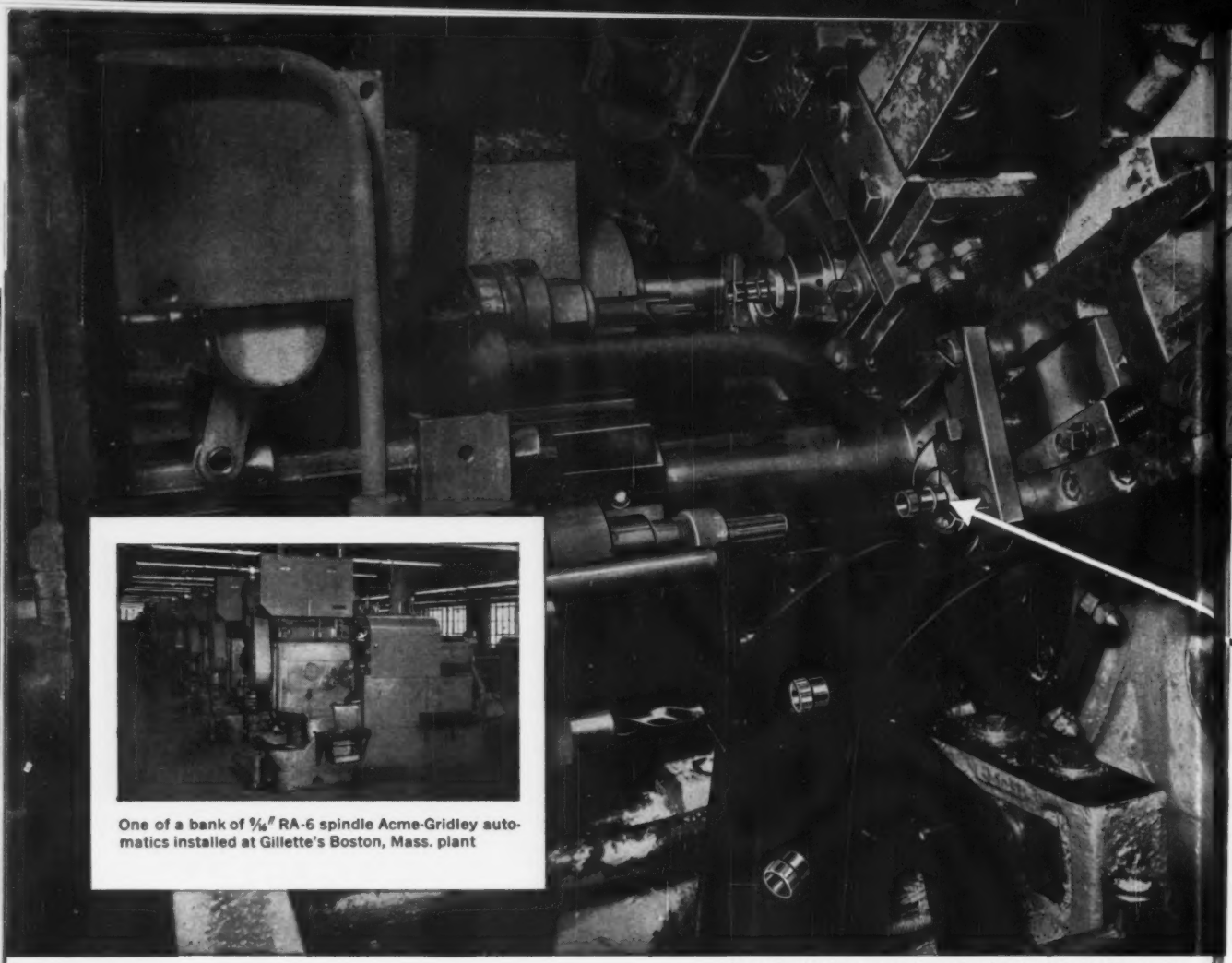
**UNITED STATES PIPE & FOUNDRY CO.**

*Steel and Tubes Division*

STEEL & TUBES U.S. PIPE DIVISION

BURLINGTON, NEW JERSEY

SALES OFFICES: BURLINGTON, BOSTON, CHICAGO, CLEVELAND, LOS ANGELES, NEW YORK, PITTSBURGH, SAN FRANCISCO, ST. LOUIS



One of a bank of 5/16" RA-6 spindle Acme-Gridley automatics installed at Gillette's Boston, Mass. plant

Close up of tooling zone showing adjusting knob in 5th position

Precisely Formed, Marked, Knurled,

Broached, Micro-finished, Reamed and Tapped . . .

# ON ONE ACME-GRIDLEY AUTOMATIC

in *4½ Seconds!*

The adjusting knob on this new adjustable razor is but one of its several precision components made by The Gillette Safety Razor Company on 7/16" Acme-Gridley six spindle bar automatics. The requirements were extremely exacting, *with as many operations as possible performed in the primary setup!*

For example: nine positions are stenciled on a turned portion of the O. D. with interrupted knurling held in exact peripheral location to the marking. In addition, close tolerance hole sizes are involved and *all* external burrs completely removed. All tools had to be synchronized to produce the exacting number-knurl relationship on the periphery.

Working in close cooperation with Gillette engineers, National Acme specialists took full advantage of the wide-open tooling zone, independently operated tool slides and the extreme accuracy and flexibility of direct camming . . . to perform an ingenious job of tooling. Many operations normally considered "secondary" were accomplished in the primary setup. Costly rehandling and "second machine investments" were reduced.

Write or ask one of our representatives for the complete story on the industry's most modern approach to *your* cost reduction problem.

Pioneer in Circumferential Automation

# National Acme

The National Acme Company
175 E. 131st Street
Cleveland 8, Ohio

**Sales Offices: Newark 2, N.J.; Chicago 6, Ill.; Detroit 27, Mich.**

# NOW...you can get

## TYPE No. 01 (A.I.S.I. or S.A.E. ANALYSIS)

# FLAT GROUND DIE STEEL

## OIL HARDENING

# from SIMONDS

For tool makers, die shops and machinists who prefer or who have standardized on Type No. 01 Oil Hardening Steel, SIMONDS now offers the most complete range of stock sizes in flats and squares made from Simonds own steel of No. 01 chemical analysis.*

Precision ground and ready-to-use, all "1001" sizes are accurate and uniform in dimension and have an extra smooth surface with edges and ends finished and squared. Heat treatment is simple and foolproof, with excellent results assured. Best of all, you can get delivery now of No. 01 Type as well as Air Hardening and Low Carbon Type Flat Ground Steel from Simonds distributors' stocks backed up by Simonds warehouse stocks in Boston, Newark, N. J., Detroit, Chicago, Shreveport, La., Los Angeles, San Francisco and Portland, Oregon.

For Fast Service from Complete Stocks Call your SIMONDS Industrial Supply DISTRIBUTOR

**SIMONDS SAW AND STEEL CO.**
FITCHBURG, MASS.

*Factory Branches in Boston, Newark, N. J., Detroit, Chicago, Shreveport, La., Los Angeles, San Francisco and Portland, Ore. Canadian Factory in Montreal, Que., Simonds Divisions: Simonds Steel Mill, Lockport, N. Y., Heller Tool Co., Newcomerstown, Ohio Simonds Abrasive Co., Phila., Pa., and Arvida, Que., Canada*

*

**CHEMICAL ANALYSIS**
Spheroidize Annealed —
Non-Deforming
Type No. 01 Oil Hardening
**Flat Ground Die Steel**

| | | | |
|---|---|---|---|
| C | .85- .95 | Cr | .40-.60 |
| Mn | 1.00-1.25 | W | .40-.60 |
| Si | .20- .40 | V | .10-.20 |

Hardening Range —
1450° to 1500°F.

**SIMONDS AIR HARDENING**
(5% chrome)
Spheroidize Annealed —
Non-Deforming Type
**Flat Ground Die Steel**
*Chemical Analysis*

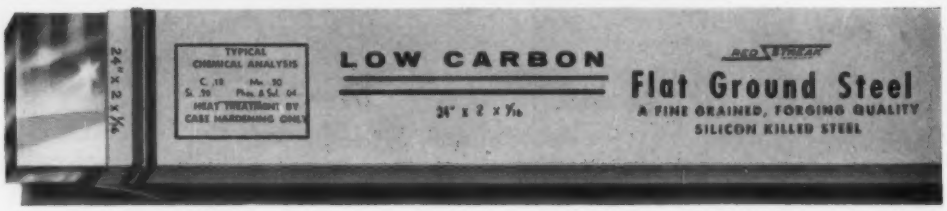
| | | | |
|---|---|---|---|
| C | .95-1.05 | Cr | 5.00-5.50 |
| Si | .30- .50 | Mo | .90-1.10 |
| Mn | .50- .70 | V | .20- .30 |

Hardening Range —
1700° to 1800°F.

**SIMONDS LOW CARBON**
Fine Grained — Silicon Killed
**Flat Ground Steel**
*Typical Analysis*

| | | | |
|---|---|---|---|
| C | .18 | Si | .20 |
| Mn | .50 | S | .04 |
| | P .04 | | |

Can Be Case Hardened Only


24" x 2 x 5/16
TYPICAL CHEMICAL ANALYSIS
HEAT TREATMENT BY CASE HARDENING ONLY
LOW CARBON
36" x 2 x 5/16
RED STREAK
Flat Ground Steel
A FINE GRAINED, FORGING QUALITY SILICON KILLED STEEL

# UNITED®

## 46" x 90" SLABBING MILL

**UNITED ENGINEERING AND FOUNDRY COMPANY**

**PITTSBURGH, PENNSYLVANIA**

*Plants at* Pittsburgh, Vandergrift, Youngstown, Canton, Wilmington

SUBSIDIARIES: Adamson United Company, Akron, Ohio; Stedman Foundry and Machine Co., Inc., Aurora, Indiana

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

# FREE BULLETIN...
# TURN TRASH INTO CASH

Just produced by Handy & Harman—this new Refining Bulletin describes the great cash potential in precious metals industrial waste . . . lists many possible sources. Types and forms of refinings are illustrated photographically and described in text. Equally important, the bulletin calls attention to the fact that much of industry's valuable waste is truly wasted.

For your free copy of this new and cash-provoking bulletin, write to Refining Division, Handy & Harman, 82 Fulton Street, New York 38, N.Y. Your biggest dividend will come when you send a refining lot to Handy & Harman and see for yourself the cash benefits you get from the country's leading refiner of precious metals waste.

**Your No. 1 Source of Supply, Refiner and Authority on Precious Metals Alloys**

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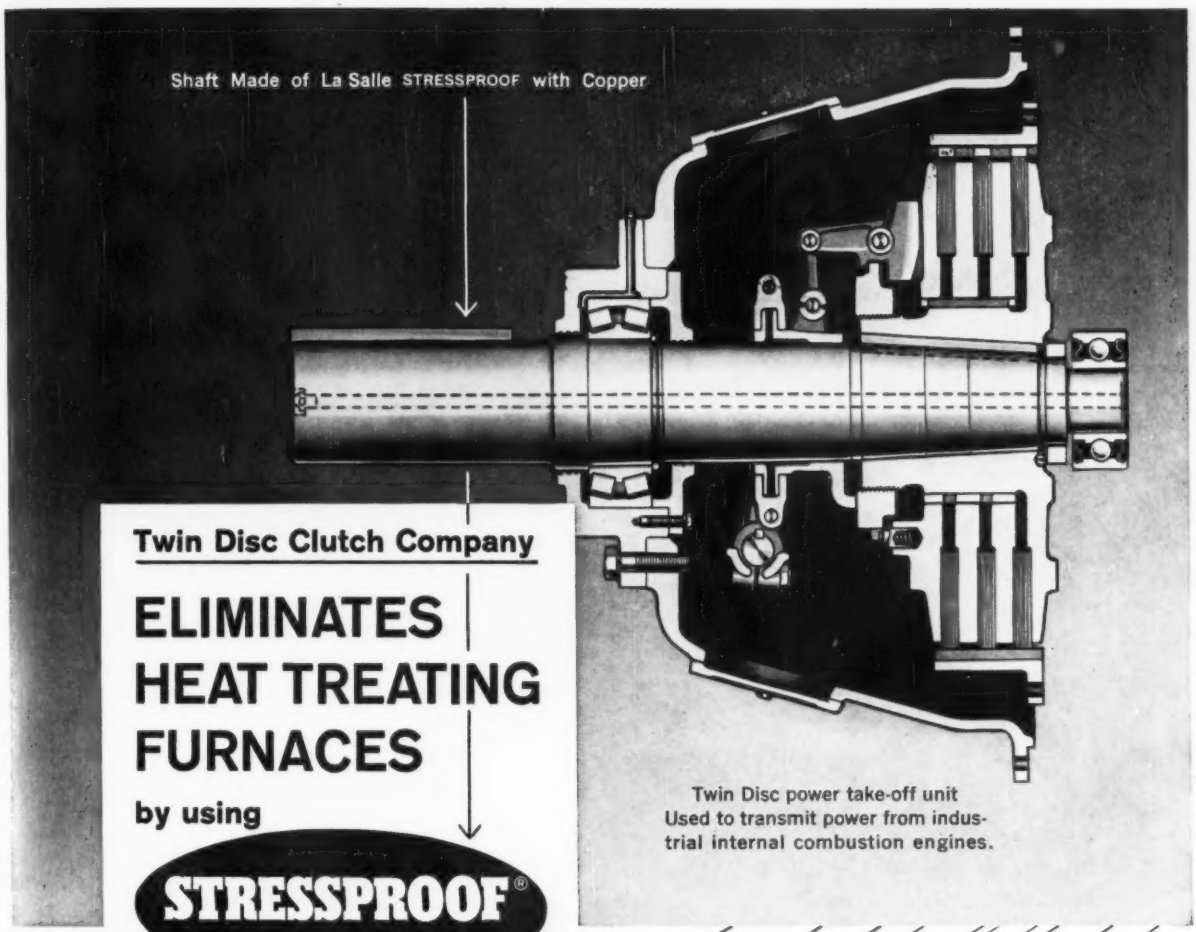



Twin Disc power take-off unit
Used to transmit power from industrial internal combustion engines.

**Twin Disc Clutch Company**

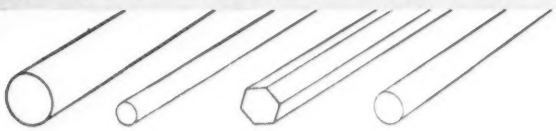
# ELIMINATES HEAT TREATING FURNACES

**by using**

**STRESSPROOF®**

**with copper**

## STEEL BARS



In Racine, Wisconsin, Twin Disc Clutch Co. saved money on a plant addition by eliminating heat treating furnaces . . . and they continue to save on part costs by using a material which needs no heat treatment . . . STRESSPROOF.

On the strength of over 15 years' experience with STRESSPROOF, Twin Disc knew they could cut their costs by purchasing this material which has the necessary properties in the bar.

They produce about 150 different models of power take-off shafts . . . see cross-section drawing. These shafts must possess great toughness and have the strength to take heavy loads. They must resist wear at the journals. Because one end of each shaft must be machined to individual customer specifications, machinability is important. Warpage after machining cannot be tolerated.

STRESSPROOF with copper fills these requirements on all counts because it has these four qualities in the bar: (1) Strength without heat treating. (2) Machinability (copper further improves machinability). (3) Excellent resistance to wear. (4) Minimum warpage.

By using STRESSPROOF, Twin Disc eliminates the cost of heat treating, cleaning and straightening. Working conditions are better . . . the plant is cleaner and cooler, and floor space requirements are less. Time and money consuming production steps are eliminated.

Twin Disc gets better parts at lower cost, and perhaps you can profit by their experience. Unless you have investigated STRESSPROOF recently, you may be overlooking worthwhile savings, especially since copper has now been added to improve machinability.

Available from your Steel Service Center.

---

*La Salle* STEEL COMPANY
1436 150th Street, Hammond, Indiana

Please send literature describing La Salle STRESSPROOF with copper.

name_____

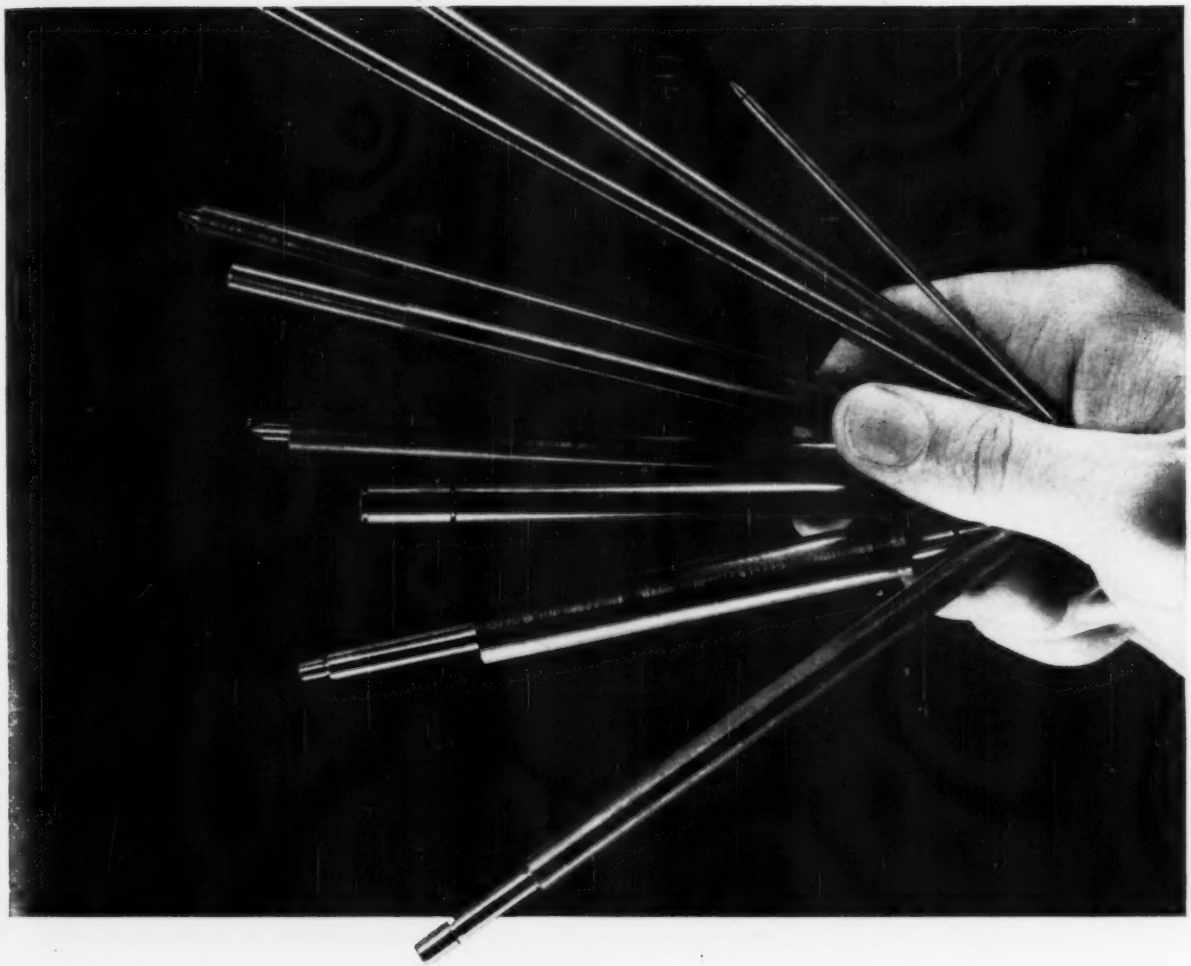
title_____

company_____

address_____

city_____ zone_____ state_____

Service...
Consists of the right products delivered at the right time at the right price.
Almost every manufacturer claims superior service. We are proud that we are one company, who actually delivers it.
FERRY CAP
& SET SCREW COMPANY
2151 Scranton Road • Cleveland 13, Ohio
Cold upset screw products
...standards and specials.



## Which will inspect these shafts faster... mechanical or optical gaging?

Over 25 different metal shafts go into the calculators made by Monroe Calculating Machine Company.

In the past, inspection of these shafts required the use of a large number of "go" and "no-go" gages. Rate? *About 7 per minute.* In addition, gage surveillance was both time-consuming and expensive.

Then the switch was made to optical gaging, using a Kodak Contour Projector. The method is simple: A master shaft is positioned to either upper or lower tolerance limits on the screen. Then the part to be inspected is placed in the same position.

Rate with optical gaging? *About 17 per minute!* And, there's no longer a need to send gages back to the crib for resetting. One Kodak Contour Projector does the whole job.

Besides saving time, optical gaging with a Kodak Contour Projector offers you a chance to *cut* down on gage costs, use operators with little or no training, and often obtain accuracy *not* possible by other means.

Where can you use optical gaging? Almost *anywhere* in the plant—receiving, assembly, production, final inspection, toolroom.

Facts about Kodak Contour Projectors are spelled out in a brochure which you can get by writing to the address below. After you've had a chance to look over the contents of the book, we'd like to demonstrate *why* and *how* one of the six Kodak models will best fit your inspection needs.

Use of low-cost Model 8 Kodak Contour Projectors enabled the Monroe Calculating Machine Co., a division of Litton Industries, to more than double inspection rates.

**Special Products Sales**

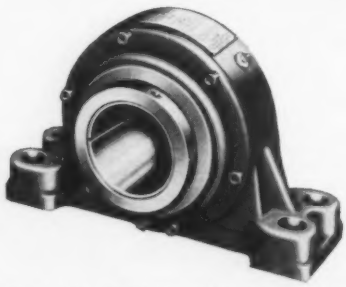
**EASTMAN KODAK COMPANY, Rochester 4, N. Y.**

# the KODAK CONTOUR PROJECTOR

Kodak

## DODGE STEEL CONVEYOR PULLEYS • DODGE STEEL PILLOW BLOCKS CHOSEN FOR WEIRTON'S NEWEST CONVEYOR SYSTEM

**DODGE TAPER-LOCK STEEL CONVEYOR PULLEYS**



**DODGE ALL-STEEL PILLOW BLOCKS WITH TIMKEN BEARINGS**

Two of the most dependable products known in the field of mechanical power transmission are used to insure the uninterrupted flow of material in the new plant of Weirton Steel Company division of National Steel Corporation. Dodge Taper-Lock Steel Conveyor Pulleys and Dodge All-Steel Pillow Blocks with Timken Bearings, were chosen for the entire system of belt conveyors—designed and installed by Koppers Company, Inc., Engineering and Construction Division.

Maximum strength with minimum weight is provided by Dodge Conveyor Pulleys. The steel rims, discs and hubs are fused together into jointless drum construction for terrific impact resistance. And with the unsurpassed holding power of Taper-Lock mounting there is no "walking on the shaft."

Dodge All-Steel Pillow Blocks are expressly designed for industry's toughest jobs. They are rugged, compact, fully self-aligning—with *high* radial and thrust capacities. And they are permanently adjusted, lubricated and sealed at the factory—for a long life of dependable service.

DODGE MANUFACTURING CORPORATION
800 Union Street, Mishawaka, Indiana

**DODGE**
*of Mishawaka, Ind.*

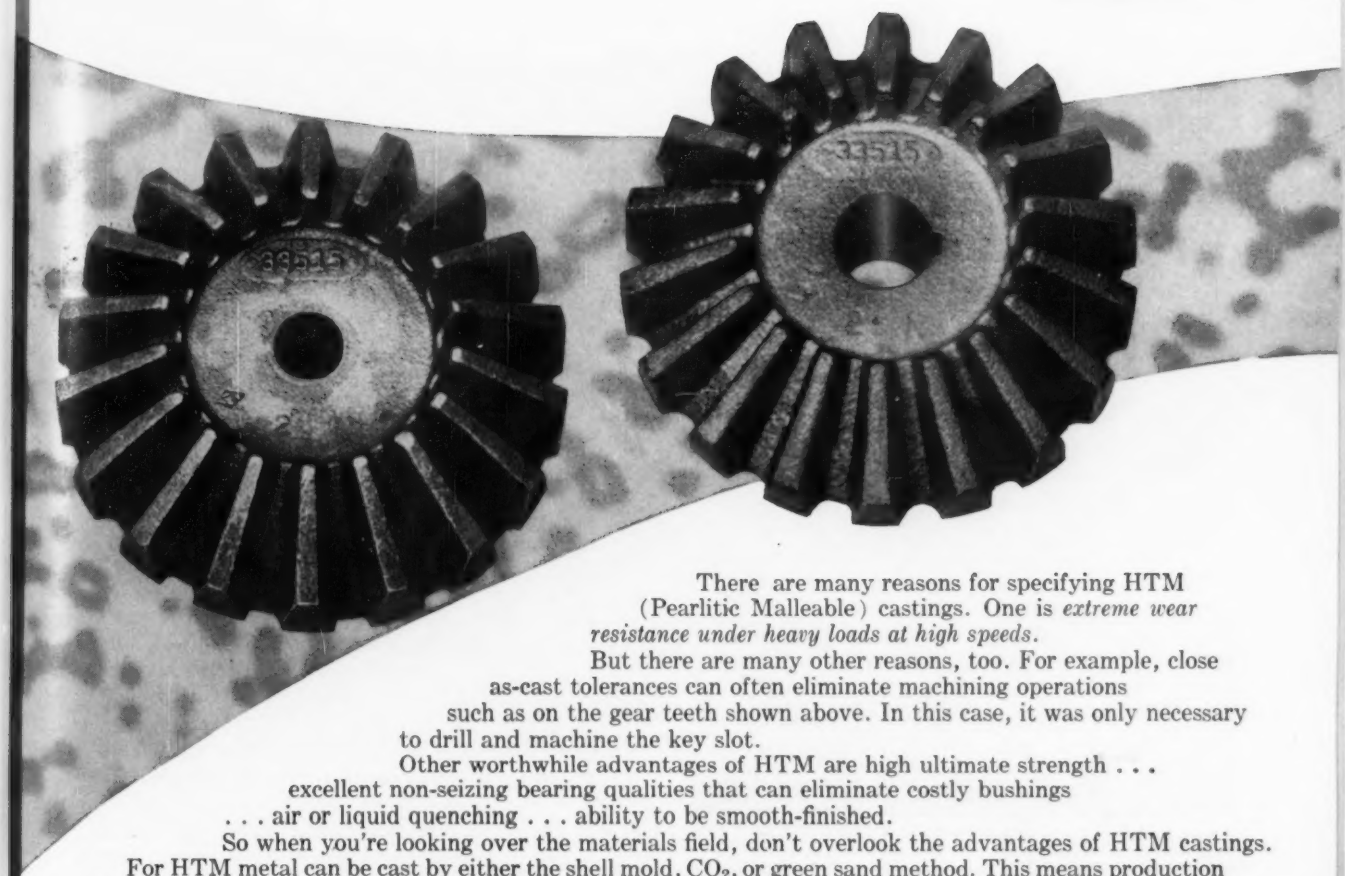
**CALL THE TRANSMISSIONEER**—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the *white* pages of your telephone directory for "Dodge Transmissioneer."

*is your problem*

# wear resistance?

## NATIONAL HTM CASTINGS

*are the answer*



There are many reasons for specifying HTM (Pearlitic Malleable) castings. One is *extreme wear resistance under heavy loads at high speeds.*

But there are many other reasons, too. For example, close as-cast tolerances can often eliminate machining operations such as on the gear teeth shown above. In this case, it was only necessary to drill and machine the key slot.

Other worthwhile advantages of HTM are high ultimate strength . . . excellent non-seizing bearing qualities that can eliminate costly bushings . . . air or liquid quenching . . . ability to be smooth-finished.

So when you're looking over the materials field, don't overlook the advantages of HTM castings. For HTM metal can be cast by either the shell mold, $CO_2$, or green sand method. This means production costs tumble . . . performance and saleability of your product go up.

AA-6928

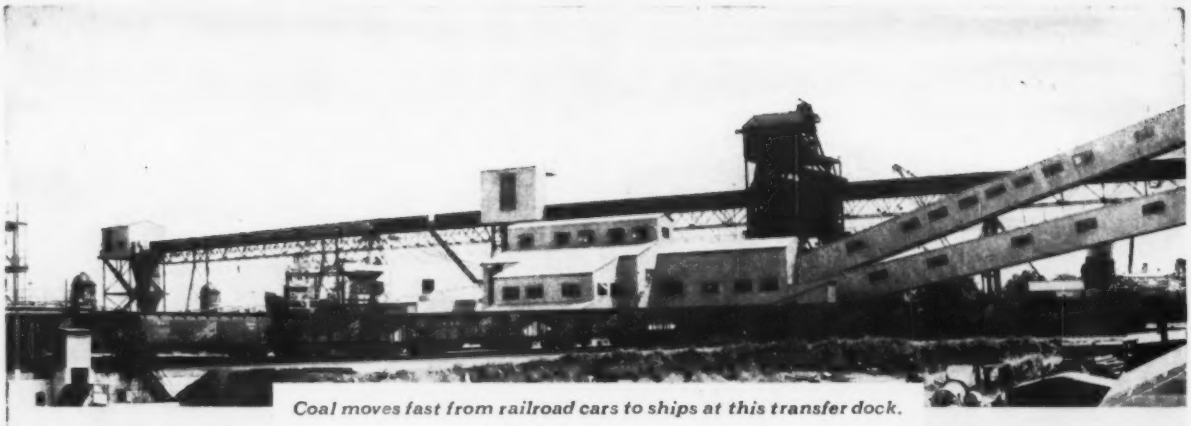
| IMPORTANT PHYSICAL PROPERTIES | |
|---|---|
| Brinell | 163 to 302* |
| Yield, psi | 48,000 to 85,000* |
| Ultimate, psi | 70,000 to 110,000* |
| Elongation, % | 7 to 2* |

*Depending upon grade

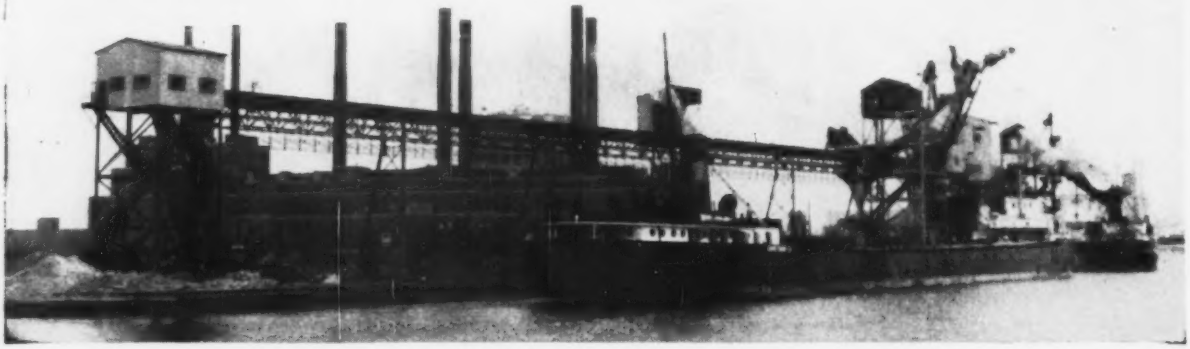
**NATIONAL MALLEABLE and STEEL CASTINGS COMPANY**

*Established 1868* — *Cleveland 6, Ohio*

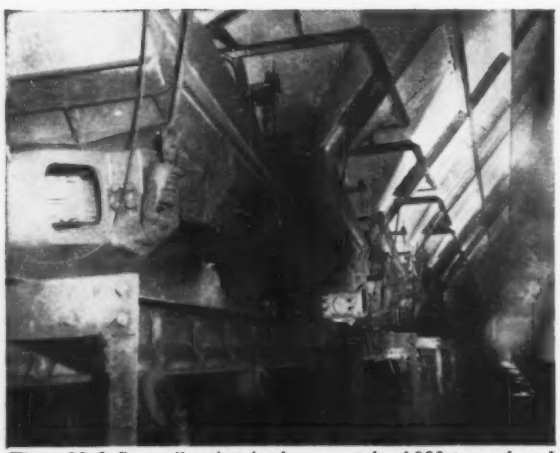
*The nation's largest independent producer of malleable and pearlitic malleable*



*Coal moves fast from railroad cars to ships at this transfer dock.*



# Rapid handling improves competitive position of 29 participating coal companies



*These 20 Jeffrey vibrating feeders can take 4,000 tons of coal per hour from hoppers under car shake-outs. Electronic controls vary the feed to assure a uniform rate of flow to the 72-inch conveyor belt that carries the coal to boat loading telescopic chutes.*

COAL is transferred quickly, economically, from railroad cars to ships here at Rail-to-Water Corporation's Chicago docks. This permits the 29 Midwestern coal companies who are partners in this enterprise to sell their coal on the Great Lakes.

Typical equipment contributing to the speed which spells economy is this line of 20 Jeffrey electric vibrating feeders. They keep coal on the move with a minimum of attention, saving manpower. Vibrations are timed to their natural mechanical frequency, insuring minimum use of power and quiet, trouble-free operation. No wearing of parts, so maintenance costs and downtime are low.

Catalog 870 describes Jeffrey vibrating feeders. The Jeffrey Manufacturing Company, 925 North Fourth Street, Columbus 16, Ohio.

JEFFREY

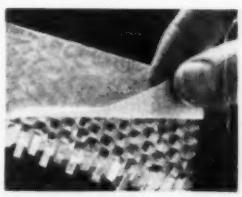
CONVEYING • PROCESSING • MINING EQUIPMENT . . . TRANSMISSION MACHINERY . . . CONTRACT MANUFACTURING

**THREAD-THIN** contact is all that's required to bond the open end of the thimble. The adhesive used here holds fast at over 5000 psi in overlap shear (aluminum-aluminum); makes load-bearing honeycomb sandwich structures practical.

*FROM 3M RESEARCH*

# *Adhesives that meet bonding problems "edge on"*

3M research-developed adhesives can hold over 600 pounds on the rim of a thimble. Industry is putting this strength to work in hundreds of ways.



**AIRCRAFT WINGS,** for example, are being built of lighter, far stronger honeycomb sandwich structures, thanks to 3M Composite Film Adhesives. These dry adhesive films turn liquid, then cure under bonding heat. Their remarkably high peel strength holds wing skin and core intact for the life of the plane.

**THESE SAME WINGS** are coated with other 3M products—erosion-resistant coatings. They protect the leading edges from the destructive blast of rain and dust at supersonic speeds.

**3M SEALERS** help make fuel tanks leakproof. They do this vital job in spite of extreme vibration, structural flexing, thermal expansion and contraction of the sealed surfaces, rapid temperature changes.

**SEE WHAT** 3M Adhesives can do for you! For information and free literature, write: 3M, A. C. & S. Division, Department YP-49, 900 Bush Ave., St. Paul 6, Minnesota.

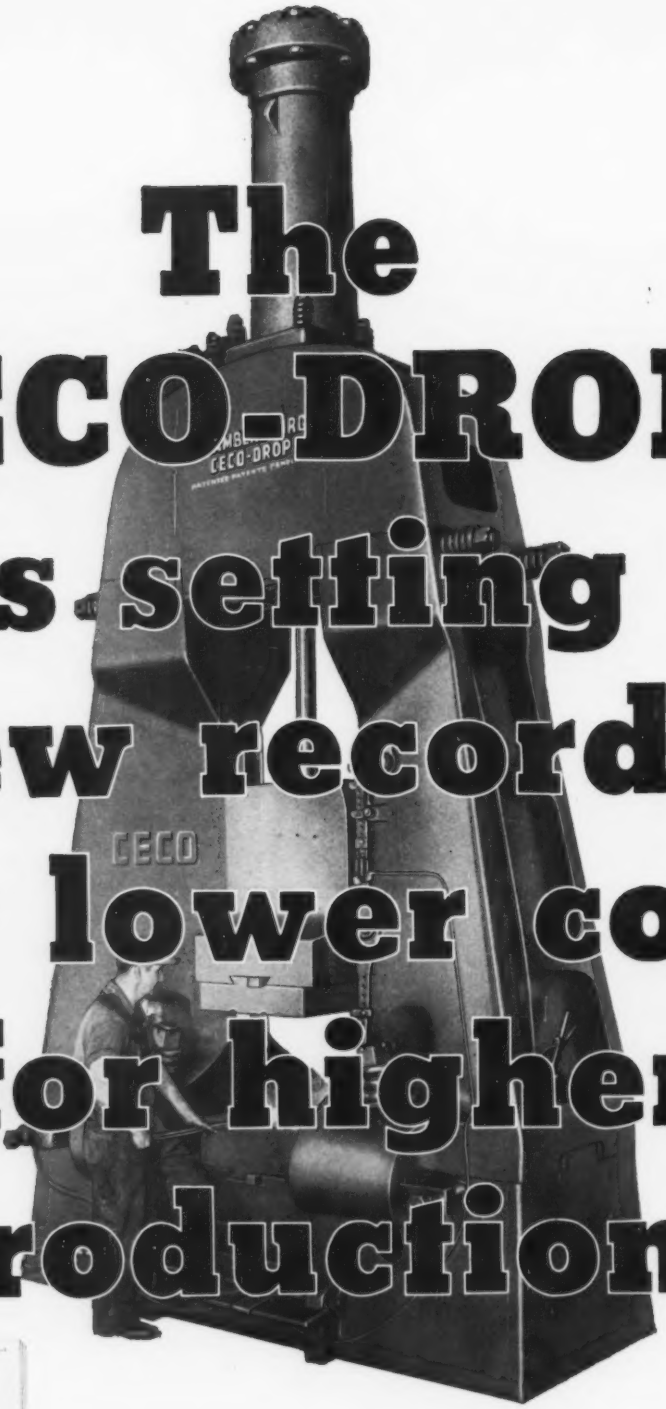
ADHESIVES, COATINGS AND SEALERS DIVISION

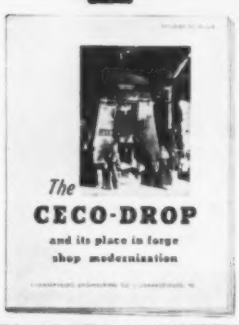
**MINNESOTA MINING AND MANUFACTURING COMPANY**

**. . . WHERE RESEARCH IS THE KEY TO TOMORROW**

3M COMPANY

# The CECO-DROP is setting new records -for lower costs -for higher production




← **Chambersburg's new 28 page forge shop modernization bulletin. Based on studies made in prominent forge shops, this publication assists you to formulate your own step-by-step modernization program. Write for a copy today.**

**CHAMBERSBURG ENGINEERING COMPANY · · CHAMBERSBURG, PA.**

# JONES & LAMSON "AUTOMATION"

the man who needs a new machine tool is already paying for it

## Numerical Control . . . what's it worth?

What *about* numerical control: is it all it's cracked up to be? The answer, in a word, is "yes". Here's why. With numerical control, the *big* factor is *flexibility*. Tape or numerical programming can be employed economically for medium or small lot production, even down to *single pieces*. Accuracy is also increased. For instance, Jones and Lamson tape controlled positioning units hold tolerances of ±.001 on applications for punching, drilling, boring or similar operations where point-to-point positioning is mandatory. Machine set-up and change-over become primarily an office procedure. Numerical control of machining operations eliminates the need for cams, templates, even prototype parts and special fixtures. It results in greater machine utilization, and speeds actual machining. Lead time is reduced, and because human error is largely eliminated, accuracy is improved.

Any way you look at it, numerical control has come of age. It's being used more and more, simply because it produces better, at lower costs. For detailed information, write Jones & Lamson Machine Company, Dept. 710, 511 Clinton Street, Springfield, Vermont.

Turret Lathes • Automatic Lathes • Tape Controlled Machines • Thread & Form Grinders • Optical Comparators • Thread Tools

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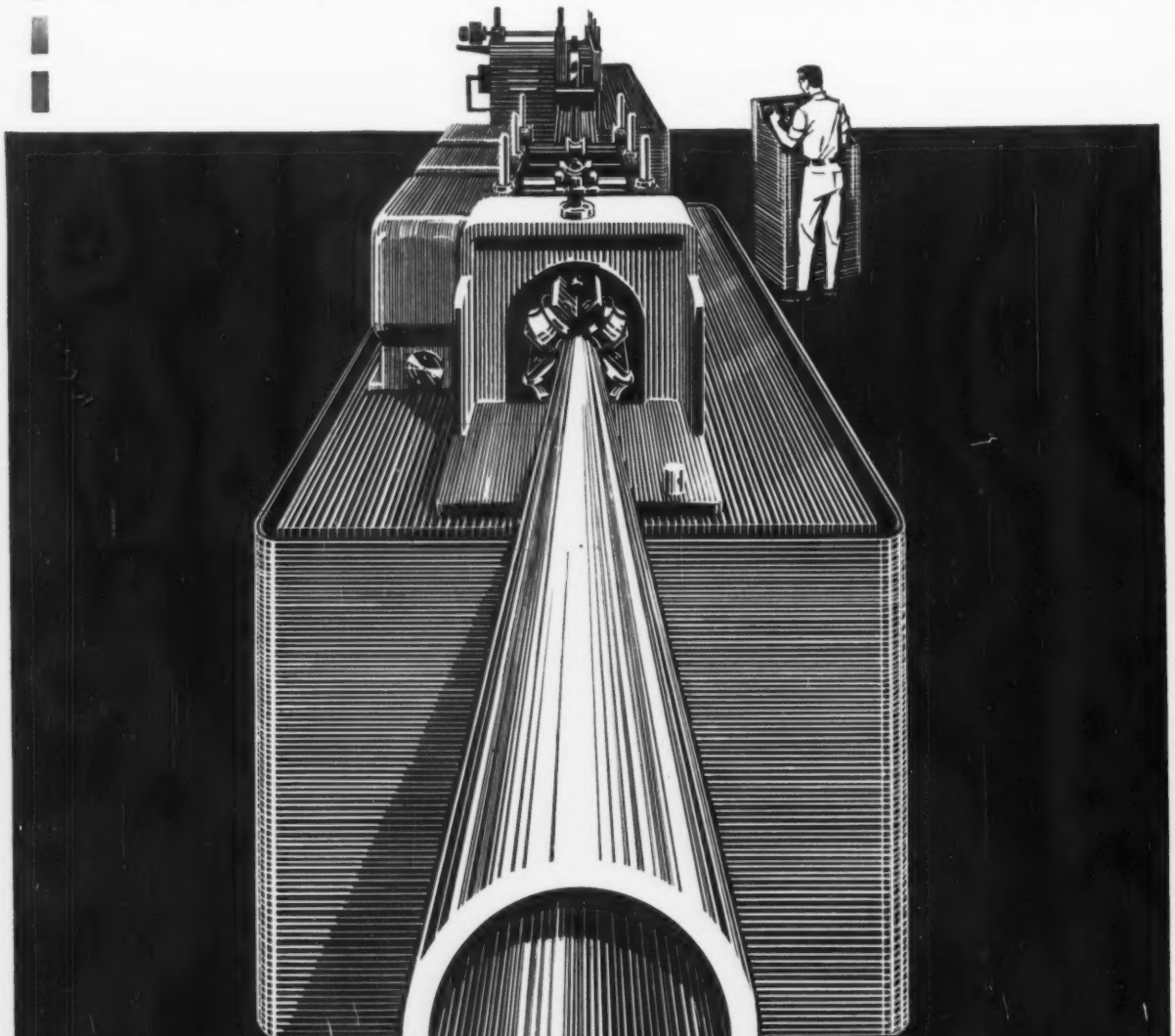
**Pipe and Tube Mills**—Product dependability—integrity of manufacture—engineering for specific production needs have all contributed to establish Yoder equipment as the industry standard of excellence. Since 1909 Yoder-built machinery, including Pipe and Tube Mills, Roll Forming Equipment and Rotary Slitters, have earned world-wide customer satisfaction and recognition. Profit from Yoder's years of engineering and service experience. Send today for the illustrated Yoder Pipe and Tube Mills Book.

**THE YODER COMPANY • 5510 Walworth Avenue • Cleveland 2, Ohio**



ENGINEERING YODER MANUFACTURING

**PIPE AND TUBE MILLS (ferrous or non-ferrous)**

**COLD ROLL FORMING MACHINES**
**ROTARY SLITTING LINES**

# *Roebling Wire in convenient bulk packaged to make your products easier*

If you use high-carbon wire in sizes from .060" diam. to .030" diam., it will pay you to investigate Roebling's Reel-less Core Packaging System. This method offers you substantial savings in several ways—to say nothing of the quality wire that Roebling always delivers in any kind of package.

*Here's how simple it is:*
Cores are palletized two cores per pallet and can be stacked two or three pallets high (think of the saving in storage space).

Empty reels are not accumulated because there are no reels to store, send back, bookkeep, get credit on, or pay shipping charges on (either way). Just unwrap the wire, set it up the way you see here, and there you are. Where a limited number of reel-less core packages are used, or where wire is flipped from reels mounted in a horizontal position, the tilt table is not necessary.

This method is typical, indeed, of Roebling's efforts to make quality easier to handle and to banish the problems that cost you time, money and sharp pains across the brow.

Full details of wire without reels will be immediately forthcoming when you write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

**ROEBLING**

*Branch Offices in Principal Cities*
*Subsidiary of The Colorado Fuel and Iron Corporation*

# HOW TO END CONVEYOR BELT CLEANING PROBLEMS

*Unique OSBORN ROTA-MASTER® brushes do the job automatically... can cut your downtime and maintenance costs now*

**Newest Osborn Rota-Master® Brush** cuts your costs three ways: Newly developed KORFIL®P fill material is extra-rugged . . . cleans more thoroughly, wears far longer. New lightweight extruded aluminum mounting is easier to handle and install. Mounting is re-usable . . . replacement brush strips are easily inserted when finally needed. Available in 16", 18" and 24" face widths. Assemble in multiples for any belt size.

**CARRYOVER** on rubber and fabric conveyor belts can cause destructive wear—and add costly downtime hours spent in frequent cleaning. Osborn Rota-Master® Brushes automatically and efficiently prevent buildup of such materials as chemicals, food, tobacco, chips, core sand, coke and ore on belts, rolls, snubber pulleys and return idlers.

Easy to install and adaptable to any system—Rota-Master Brushes clean conveyor belts with a unique, flexible sweeping action that does a thorough job. Brushes are self-cleaning, simple to adjust for correct brushing pressures.

An **O**sborn **B**rushing **A**nalysis—at no obligation—can pinpoint exactly how you can cut costs and simplify your conveyor cleaning. *Write for details now. The Osborn Manufacturing Company, Dept. F-80, Cleveland 14, Ohio.*

**Write For Rota-Master® Brush Booklet** . . . includes complete application, specification and operational data for all types of conveyor belt cleaning requirements.

Osborn Brushes

POWER, PAINT AND MAINTENANCE BRUSHES • BRUSHING METHODS • BRUSHING MACHINES • FOUNDRY PRODUCTION MACHINERY

STEEL USERS WILL HAVE INVENTORIES of 90 to 100 days by June 30, possible strike deadline. But over-all figures can be misleading. An IRON AGE survey indicates some steel users would begin to feel a strike pinch after 30 days. After 45 days, the pressure for a strike settlement would be almost irresistible.

IF THERE IS NO STEEL STRIKE, will there be a sharp letdown in raw steel output? The Survey shows that the high-demand momentum probably will carry over into July. After that, the steel business will be relatively slow.

FOREIGN RESEARCH AND MANUFACTURING are looking better to U. S. companies. Lower labor cost is biggest reason. A growing number of companies are talking of moving production units overseas.

RUMORS THAT DE SOTO WILL BE ABANDONED are denied by the company. J. B. Wagstaff, general manager, says nearly $25 million is being invested in engineering and styling of future models. All the way up to 1963, which is on drawing boards.

STEELMAKERS ARE STEPPING UP SALES DEVELOPMENT. The mills have acquired talent from customers. They are getting more into the business of providing customers with finished samples for testing new applications.

BUSINESS IS PICKING UP for industrial supply and machinery makers. The American Supply & Machinery Manufacturers' Assn. reports that orders in February were up 8.6 pct from the month before. The Assn.'s new order index is just 19 points shy of the pre-recession high of 221 set in January 1957.

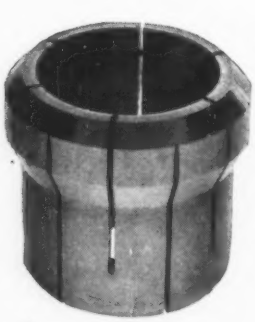
SMALL BUSINESS HAS A BETTER OUTLOOK ON LIFE. That's one conclusion to draw from a government report indicating that small business loan applications are running 35 pct ahead of a year ago. The upturn was noted in February.

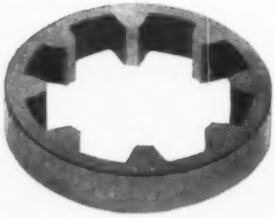
NEW CONSTRUCTION IN FIRST QUARTER set a record of $19.9 billion, reports the U. S. Depts. of Commerce and Labor. This was 12 pct better than the like period in 1958. New housing outlays were up 32 pct from a year ago. Office and industrial building continued weak.

RAILROAD CARLOADINGS REFLECT better business conditions. It now looks as though carloadings in the second quarter will be up about 12.5 pct from the same period last year. This is the estimate of 13 advisory boards in reports to the Assn. of American Railroads. Freight car availability is still tight.

# 52100

## HARD, TOUGH, EASY TO MACHINE FOR TRICKY SHAPES





WORKHORSE parts like those pictured above have to be tough and hard for the jobs they do. But their intricate shapes demand a steel that's easy to work.

Timken 52100 steel meets every specification for this kind of flexibility. It's a high-carbon alloy steel with high fatigue and tensile strength plus good hardenability throughout its cross section. It machines easily, yet the steel's fully spheroidized structure retains full strength and hardenability.

Working pressures up to 200,000 p.s.i. are easily withstood by Timken 52100 steel. It will oil quench to a maximum hardness of 65/66 Rockwell C in normal sections.

Uniformity from shipment to shipment is assured, too, because high Timken Company standards control quality from melt shop to final inspection.

Timken pioneered 52100 tubing in America. Today, as the only U.S. source for 52100 steel in tubing, bar and wire, we continue as one of the world's largest producers of this versatile alloy.

And for small runs or emergency requirements, we maintain a mill stock of 52100 tubing in 101 sizes from 1″ to 10½″ O.D. Write today for a complete stock list of available sizes, grades and finishes. The Timken Roller Bearing Co., Steel and Tube Division, Canton 6, Ohio. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

# TIMKEN® *Fine Alloy* STEEL

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING

# How Long Before Steel Strike Would Pinch Industry?

**IRON AGE survey shows that for some, a strike would begin to hurt after about a month.**

**After 45 days, the pressure would become irresistible for a settlement. Strong business comeback hampers inventory buildup.**

▪ If there is a steel strike, how long will industry be able to hold out before feeling the pinch?

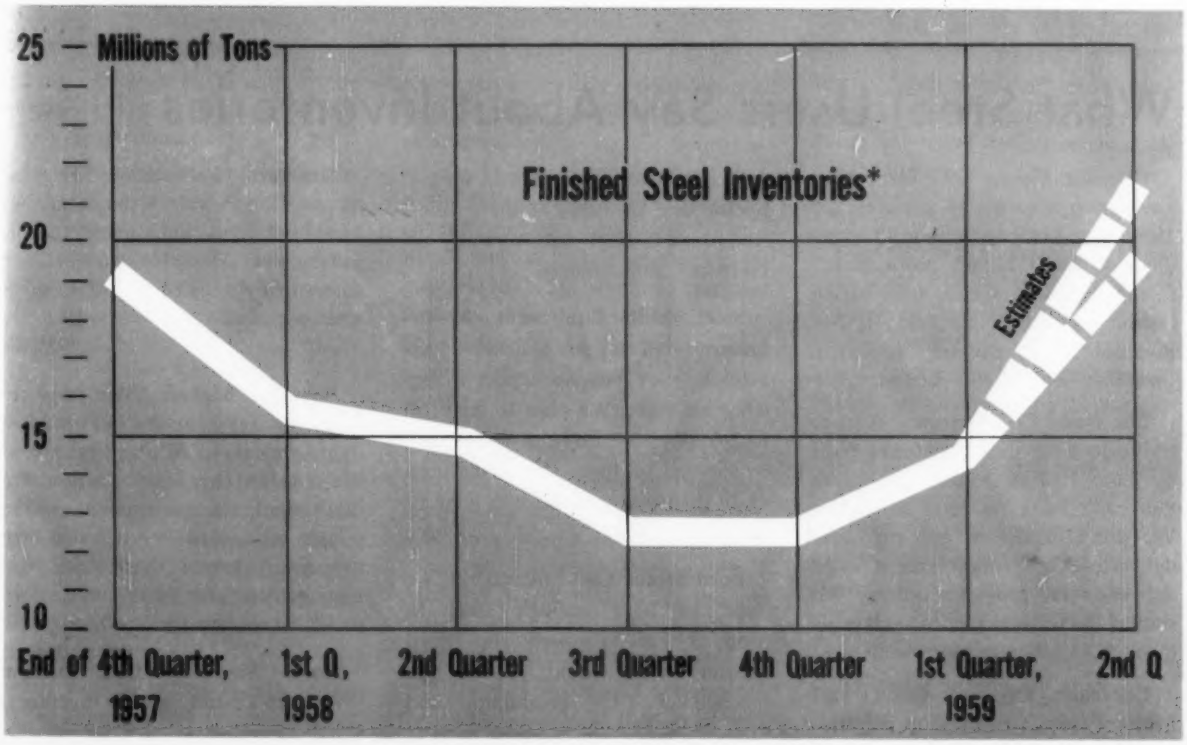
The IRON AGE set out to find the answer to that question last week. On the basis of a nationwide survey, here it is:

**1. By June 30, possible steel strike deadline, over-all steel inventories, including some semi-manufactured items and components, (see chart below) will exceed 20 million tons. This would be enough to last 90 to 100 days, if it were evenly distributed, which it won't be.**

**2. Most steel users hope to have enough on hand to maintain output for 60 days. At least that's what they're shooting for. They figure a steel strike wouldn't be allowed to go on for more than 60 days, anyway.**

**3. A small minority of users would be in trouble after about a month. Not serious trouble, but enough that they would begin to pressure anybody who would listen to get steel plants back into production. These are the outfits who for one reason or another can't build inventories. Either they (1) can't afford the extra cost, (2) don't want to, (3) started too late, or (4)**

## Steel Stocks: From Molehill to Mountain




*Inventories include steel shipped from mill but not yet in the form of finished end product. They include about 5 million tons in steel service centers (warehouses) and another 5 million tons in components such as fenders and fasteners. In terms of unformed finished steel held by individual manufacturing plants, the July 1 supply is expected to be 50 days. At start of the year, it was 15 to 20 days.

**can't get on mill order books for delivery before June 30.**

**4. After a month and a half, everybody would be scared enough that the pressure for a settlement would be irresistible. The reason: Nearly half the 90-100 day stockpile mentioned above will be in the form of service center (warehouse) steel and components, like auto fenders and fasteners. Raw steel in the hands of fabricators will be enough to last for only about 50 days. Assuming again that it would be evenly distributed, which, of course, is impossible.**

**5. Even if you discount the steel users who habitually cry "Wolf" just to stir up some excitement, some companies have not been able to build inventories to what they consider a "safe" margin. And the reason is that their own business has been so good that they're using more steel than they thought they would be.**

One of these is Bargar Metal Fabricating Co., Cleveland: "We started inventory building in January and February by projecting our order pattern," says Roger Carr, purchasing agent. "We had hoped to have a three-month inventory on hand by the end of June. But orders have picked up so fast in the last few weeks that the steel is going out the front door as fast as it's coming in the back."

**Midwest Is Tough**—It's hard to say just how widespread this sort of thing is. More of it turned up in the hot Midwestern metalworking centers than in other areas of the country. This is probably because the Midwest was the first section to really tighten up both as a result of improved business and hedging against a possible strike. Most steel users contacted seemed to be rebuilding inventories just about as they had planned.

As is usually the case in any potential steel labor crisis, the critical problem facing the mills and their customers is one of distribution as opposed to over-all supply.

**Aces-in-the-Hole** — Fortunately, service centers should be in good enough shape to take care of their regular customers for a considerable period, plus some emergency help for users who normally buy direct from the mills.

Another ace-in-the-hole is the greater availability of foreign-made steel. The importers have been doing a thriving business both in terms of direct shipment to users and to warehouses for later distribution.

**Import Prices Rise**—The strong U. S. demand for some products has encouraged importers to raise their prices an average of about $7 per ton. This has stirred up some resentment, but in most cases the foreign mills still seem to be able to deliver at prices below those of domestic mills.

Meanwhile, apart from the qualifications that must be considered in terms of what it means to individual steel users, there seems little doubt that the steel inventory

# What Steel Users Say About Inventories

**Chrysler Corp.:** "We expect to have enough to see us through the 1959 model run and about 45 to 60 days of 1960 model production." Company can't see a steel strike lasting more than 60 days. It has invested $75 million in steel inventory as a strike hedge.

**The Budd Co., Detroit:** "We are trying to have our inventories built by June 1. Past experience shows you can't bank on June deliveries. We don't expect to get any steel deliveries in June except late deliveries on previous orders. We should have enough to carry us through October production."

**Chevrolet Div. of General Motors:** Inventory buildup continuing as planned.

**Electrical Equipment Maker:** "We expect to have 90 days' steel supply by the end of June. If there is no strike, we'll start cutting back on inventory immediately."

**Steel Mill Equipment Manufacturer:** "Plates got a little rugged a while back but we expect to get what we want. We plan to have 60 to 90 days of inventory on hand by the end of June. If a strike lasts more than two months, you have to give up."

**Ford Motor Co.:** "In general, we hope to have enough steel to produce cars through the third quarter. This would include the balance of 1959 production and the startup of 1960 models. If there is no strike, we would start an orderly reduction of inventories."

**Structural Fabricator:** "Because of our low level of business, we have not had too much trouble getting steel. However, we have had some trouble getting 900 tons of steel we need for a job starting in May."

**Bearings Maker:** "We hope to have 45 days' inventory on most items and about 60 days on a few. We consider this a safe margin. We don't think the government or the people will allow a steel strike to last much longer than that. And management and labor can't afford to let it go any further."

**Davis Stamping Co., Detroit:** "We aren't building any inventory. We'll carry a normal 30-to-35 day inventory. We are only buying to meet current requirements."

buildup during the next 90 days will be the greatest in history.

**Buildup Versus Consumption**—In this period, plants will pile steel into storerooms and workshops at the rate of 2 million tons a month. They will accumulate six million tons in the quarter and a total of eight million tons in the first half.

At the same time, the buildup has come in the face of rising consumption. Industry sources estimate some 38 million tons of steel will be chewed up during the first half. That's 12 pct more than in the first half of 1958. By June, consumption will be running at 6.8 million tons a month. That will be 13 pct more than the monthly average for the first quarter of this year and 16 pct better than last year's second-half average.

**Shipments Are Up**—Steel shipments in the first half are expected to total 46 million tons, or roughly 50 pct more than the first half of 1958. Increased use accounts for four million tons of the gain. The remaining 12 million tons—or 75 pct of the change—represents inventory fluctuation. Plants were liquidating last year; they are accumulating today.

In terms of ingot production, inventory is accounting for 20 to 25 points on the operating scale. If inventories were being held level and production were geared strictly to consumption, the steel operating rate would be 70 pct instead of 94 pct.

**What Strike Would Do**—A steel strike July 1 would bring forced liquidation at the rate of 6 to 7 million tons a month. Plants dependent on their own stocks would face problems at the end of a month and a half. Warehouse and process steel would afford another 30 days' protection for some.

The end of a two-month strike would almost certainly see a period of inventory buildup and strong steel operations.

**What Peace Would Do**—If there is no strike, the outlook is uncertain. Up until recently dopesters felt July would see an abrupt cutoff for inventories and steel operations. By July, they said, inventories would be over the 90-day level. Based on past experience, they would be ready to turn around.

If there were no liquidation, the reasoning went, this would mean a drop of 2 million tons a month in steel production. In the space of a few weeks the operating rate would fall to 70 pct. Moreover, the general feeling was that plants would not just hold inventories even but would slash about 2 million tons in the third quarter. The liquidation would be followed by a moderate buildup in the fourth quarter.

**Situation Has Changed** — This view has been altered by two developments. First, July orders for steel have started to come in at a brisk rate in some markets. Secondly, it begins to look as though mills will go into July with a two-week carryover from June.

If there is a contract settlement, the outlook now is that July will see another 2 million tons added to inventory. This would mean a liquidation that was later, but longer and more severe. This prospect has dimmed the enthusiasm of some for the fourth quarter.

**July Will Be Good**—"Unless we have the greatest cancellation wave of all time July figures to be a good month," says one steel man.

The two sleepers in the whole picture are consumption and shipments. Analysts see no unexpected steam in the consumption picture. Plants are using more steel but not enough more to affect inventory estimates.

**Consumption Uncertain** — However, consumption figures are developed to a great extent on the basis of indexes that use manhours as a gage of production. In a period of rapid efficiency gains, they might understate actual usage.

A fairly small error could make a big difference in inventory calculations. If consumption of steel is greater than people believe, less inventory will be accumulated and the amount on hand July 1 will last for a shorter time.

On the question of shipments, carryovers would have to be subtracted from the inventory pile. If mills fall short of commitments by two weeks, the deficit would be better than 1 million tons.

## What if There's No Strike?

**Will Production Collapse?**—With so much emphasis on inventory rebuilding during the first six months of this year, will the steel ingot rate collapse if a new steel labor agreement is negotiated without a strike?

Several weeks ago, the thinking was that there would be a sharp cutback in raw steel output after June 30 should the steel dispute be settled peaceably.

**Or Carry Through July?** — But the continuing resurgence of general business now leads some observers to belive there will be enough momentum to justify a high rate of steel output into July, with a gradual fall-off from there on.

If there is no strike, it looks as though the last five months of the year will be slow ones for steel, barring an unusually sharp pickup in economic activity.

**For Good Reason**—The reason is that steel users would have no incentive to continue a buildup of inventory. Just the opposite. Most of them probably would be inclined to cut back on inventories as long as they could count on a continuing good supply of steel.

# You Can Use Overseas Research

## More U.S. Firms Profit From Foreign Technology

**It's a growing trend. American industry is filling gaps in research with foreign help.**

**Companies with specialized problems are prime prospects. —By G. G. Carr.**

▪ American industrial research is donning the "continental look." A growing list of firms is going overseas for scientific and research personnel, laboratory facilities, and new product ideas.

"There are urgent and compelling reasons why we in the United States cannot afford to try to do everything ourselves," points out W. W. McDowell, vice-president, engineering and research, International Business Machine Corp. One basic reason is the present acute shortage of American scientists trained in particular fields. With little prospect of this tightness easing in the near future, foreign scientists make a valuable technical manpower pool which American industry cannot afford to overlook.

**It's Rewarding**—As a plus, companies with sizable domestic research facilities can often benefit from the different approaches and orientation of overseas personnel. American firms with experience in this area almost invariably report these differences to be stimulating and rewarding rather than irksome.

Companies with specialized problems can be prime prospects for foreign researchers. American science, overall, is as fine as any in the world. But there are inevitably both strengths and weaknesses. Home soft spots can often be bolstered by foreign specialists. And scientists themselves are the first to point to the international character of their work, which ultimately depends on a continuous worldwide interchange of information.

**It Costs Less**—Finally, and of major importance, actual research costs are still considerably lower overseas than in this country for the same work. American firms are repeatedly finding they can afford qualified professionals and assistants overseas for projects which would be economically forbidding at home.

Methods for gaining access to foreign scientific thought and talent can vary widely. No one way is necessarily better than another. Most firms, suggests Mr. McDowell, will develop the combination best suited to their own needs and resources. A sound first step is careful study of foreign technical and industrial publications. This in itself can often yield valuable findings and leads.

**Consultants Available**—A more elaborate method is hiring foreign consultants in fields of special interest. These men, properly selected, can provide knowledge and advice to complement domestic sources.

A variation is the establishment of "listening posts" manned by qualified technical personnel based in key overseas areas. Their basic function is to keep constantly in touch with current university and industrial research in their areas, with special emphasis on personal contact with key individuals.

**Labs to Licensing**—To exploit foreign science more directly, several companies now sponsor research work in foreign laboratories just as they do in the United States. Such sponsorship can have very real benefits both from business and national standpoints.

Still another method involves establishing cross-licensing or similar working agreements between an American company and its foreign counterpart. This method, in addi-

## Why Foreign Research Brains?

**American science is as fine as any in the world. But it has no monopoly on new ideas, new techniques, or original thought. Here are some ways U. S. research can benefit from overseas help:**

**Fill the Shortage**—In many areas of specialization, there are not enough American scientists to go around. Foreign scientists offer a valuable technical manpower pool.

**Beef Up Knowledge**—American science inevitably has both strength and weaknesses. Foreign specialists can be valuable props to domestic soft spots.

**Stimulate Ideas**—Different approaches and orientation can be stimulating and rewarding.

**Cost Savings**—Overseas research costs are considerably lower than the expense of the same work performed in this country.

tion to broadening the product base for both companies, can provide technical information exchange on a fairly sophisticated level. One variation of this is an agreement whereby the U. S. firm handles research in one area while the foreign company concentrates on different fields.

**Setting Up Shop**—Largest step is of course the establishment of a foreign research laboratory. So many factors can be involved in both the decision for such a project and its execution that it is difficult to do more than suggest some basic considerations.

First, of course, is availability of qualified personnel. Proximity to other foreign facilities or markets a given company may have is important. Cost and standard of living in suggested areas should not be neglected, particularly when American personnel are involved. Scope and cost of the project will be determined by funds available and by nature of the work to be carried on.

**Or Get Them Visas**—As an alternative to foreign laboratories, some companies have turned to importing technical personnel to work in domestic facilities. Such men are usually not hard to find. But great care must be taken in selection, both for professional and personal qualifications.

Suggested sources are universities, industry, immigration offices and refugee services, and recommendations from men previously obtained.

**One Man's Experience**—Edward S. Tallmadge, a consultant based in Milwaukee, told American Management Assn. last week that he has selected about 150 engineers and scientists for positions in this country in the last five years.

About 40 pct of these men came from Switzerland and another 40 pct from Germany, with the remaining 20 pct from virtually every country in Europe (including Iron Curtain refugees) plus India and Egypt.

# Hiring Policies Shift

▪ Increasing costs of personnel turnover have set many companies to tightening their management hiring and recruiting policies.

A survey of 200 of the nation's largest corporations by John A. Patton, Inc., Chicago consulting firm, indicates that more companies are:

1. Using more stringent standards in recruiting college graduates.
2. Considering new selection methods that would mean considerable executive reshuffling.
3. Avoiding, wherever possible, the hiring of experienced management personnel.

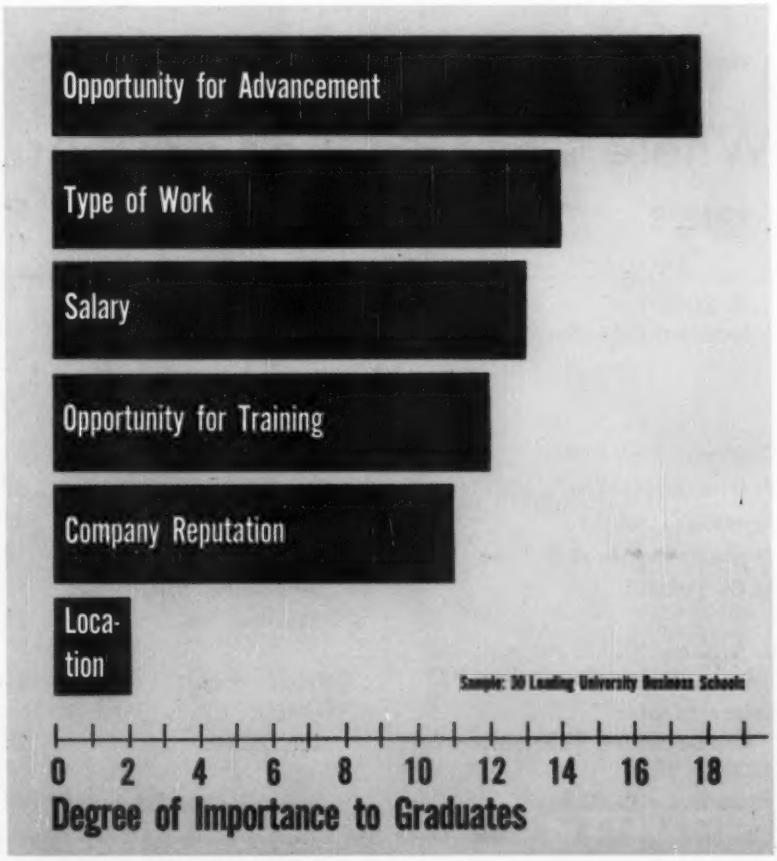
**Emphasis on Quality** — "The mounting cost of executive turnover, financially and structurally, has caused a re-evaluation of recruiting methods," the Patton firm observes. "The number of companies selling their wares on college campuses will be the same as in recent years and the intensity of bush-beating will parallel past efforts. Only the emphasis will change."

The emphasis will definitely be on quality, not quantity.

**First Choice**—The survey shows that at the outset, fringe benefits are not important to the graduate. He is interested in gaining maximum opportunity for personal growth.

The outstanding factor that will attract high caliber graduates is a good management training program. Once hired, he becomes more concerned with remuneration and overall security, the survey reveals.

## What College Grads Look For



# Behind Linepipe Sales Comeback

▪ Ambitious plans for new oil and gas transmission lines guarantee a continuing, healthy market for large linepipe.

Here are two current reasons why the sales outlook is rosier than in '58: About 9900 miles of gas transmission line will probably be put in this year as compared with only 6800 last year. And for the oil and gas industry as a whole 1959 construction is estimated at 16,000 miles—well above the 14,900 in 1958.

**Strike Jolted**—Even the immediate prospect is pleasing to linepipe producers.

Lagging production has finally been jolted to life by the threat of a steel strike this summer. Transmission pipe producers are now clamoring for second quarter deliveries.

Two big orders in the last few weeks slammed the books shut for the first half of this year. Transwestern Pipeline Co. ordered 313,000 tons of pipe from U. S. Steel's National Tube Div., Republic Steel, and Kaiser Steel. This line will run to the Pacific Coast from West Texas.

Texas Gas Transmission Corp. also ordered about 125,000 tons from Republic and A. O. Smith Corp. for a $40 million line from offshore Louisiana to Ohio.

**Down, But Not Out**—Thus, despite the double bodyblow dealt pipeline sales by the adverse Memphis decision and the recession, the industry is starting to come back strong.

(The Memphis decision prevented the Federal Power Commission from granting rate increases to transmission companies without lengthy approval processes or consent of pipeline users. Before it was reversed by the Supreme Court last December it had stymied natural gas projects and linepipe demand.)

**Reasons for Delay**—As yet slowness of the revival is due to two factors: (1) A continued bottleneck in granting FPC permits on projects; and (2) Re-evaluation of projects by pipeline firms. Non-contested certificates are granted in about 3 months and the average contested ones in 6 to 12 months. However, some have taken 3 years.

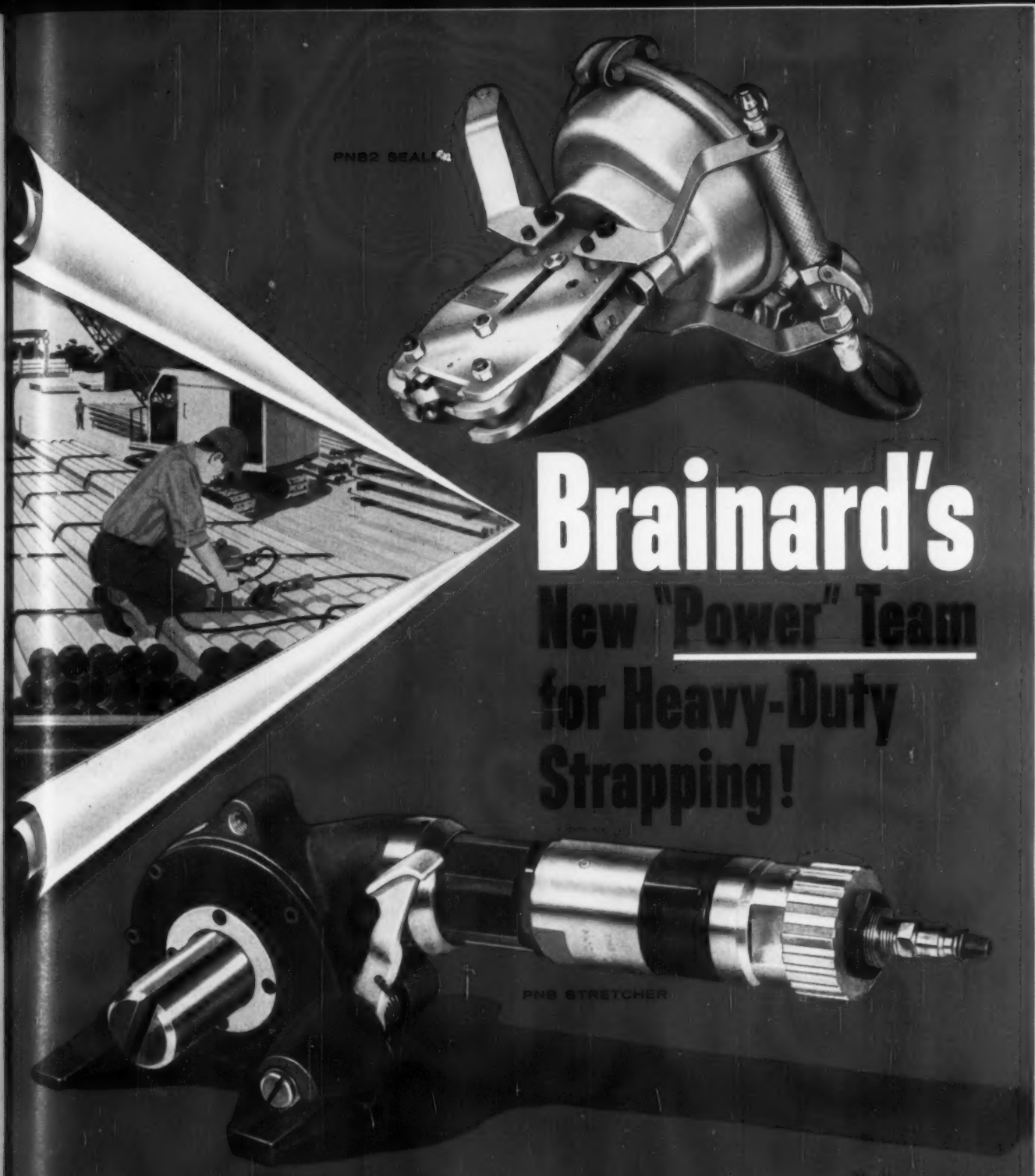
**Equipment Makers Ready**—The renewed interest has spread over to makers of pipeline equipment.

"We've had more inquiries and orders since reversal of the Memphis decision last December than we did in almost all last year," declares Eugene Miller, president of Cooper Bessemer Co., Mt. Vernon, O. "Because of the legal action as well as a cold winter which consumed a lot of gas, there has been a steady upsurge of orders and production."

## Where Linepipe Producers Are Located

| Company | Location | Size Range (inches OD) | Est. Capacity* (tons a year) |
|---|---|---|---|
| U. S. Steel | | | |
| National Tube Div. | McKeesport, Pa. | 24-36 | 280,000 |
| | | 12-¾-24 | 360,000 |
| | Lorain, O. | 12-¾-26 | 540,000 |
| | Orange, Tex | 24-36 | 360,000 |
| Colorado Fuel & Iron | Claymont, Del. | 20-36 | 95,000 |
| Bethlehem Steel | Steelton, Pa. | 18.36 | 65,000 |
| Republic Steel | Gadsden, Ala. | 20-30 | 265,000 |
| Youngstown Sheet & Tube | Youngstown, O. | 6⅝-22 | 335,000 |
| A. O. Smith | Milwaukee, Wis. | 12¾-30 | 600,000 |
| | Houston, Tex. | 16-36 | 750,000 |
| U. S. Steel | | | |
| Consolidated Western Div. | Provo, Utah | 20-36 | 360,000 |
| Kaiser Steel | | | |
| Napa-Fontana Fabricating Div. | Napa, Calif. | 20-30 | 280,000 |
| | | Total | 4,290,000 |

*IRON AGE Estimate




# Brainard's New "Power" Team for Heavy-Duty Strapping!

Two more new heavy-duty power tools added to Brainard's rapidly growing strapping system—the exclusive PNB stretcher and the PNB2 sealer—give even more cost-cutting advantages to heavy-duty strapping users everywhere.

The PNB pneumatic stretcher permits quick tensioning—automatically—and maintains it. Then the PNB2 pneumatic sealer, with a simple press of the thumb, gives a strong, safe, lasting seal.

Both tools working as a team assure you of fast, efficient heavy-duty strapping on 2" x .050 size on many types of carloading and packaging. Particularly adaptable to carloading of pipe as illustrated.

Why continue with obsolete, time-consuming equipment? Get in touch with your Brainard representative for details and prices.

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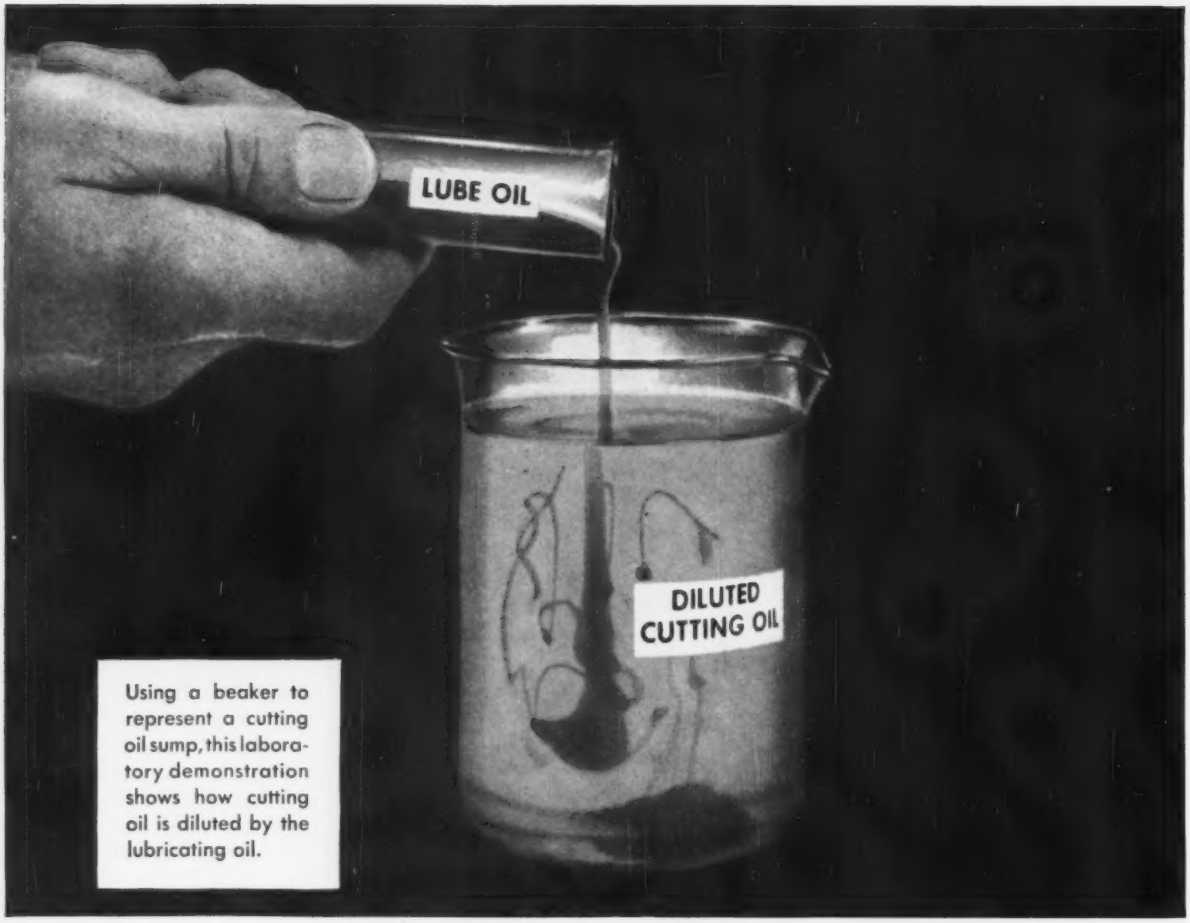
DIVISION OF SHARON STEEL CORP. • WARREN, OHIO




Using a beaker to represent a cutting oil sump, this laboratory demonstration shows how cutting oil is diluted by the lubricating oil.

# Diluted cutting oil can cut output 33%

No matter how careful your lubricating techniques, you still can't stop lube oil from leaking into the cutting oil sump on 70% of automatic screw machines. As cutting oil is diluted, it loses strength—ingredients that make it efficient become less and less effective. The natural consequence is shortened tool life, more downtime and a higher percentage of rejects.

**Texaco Cleartex can end this problem forever.** All you have to do is use Cleartex for both cutting *and* lubrication . . . and watch your production rise. The exceptional chemical stability and load-carrying ability of the Cleartex series make them equally suitable for use as cutting oils, lubricants and hydraulic fluids. (70% of all automatic screw machines can benefit from the "Cleartex Cure!")

**TAKE THE CLEARTEX CURE SOON!**

Write today for your copy of Texaco's new booklet—"Cleartex in Automatic Screw Machines." This new illustrated guide will fill you in on the details, show you where you may be losing profits and how to avoid it . . . Or contact your local Texaco Lubrication Engineer soon for an authoritative survey of your automatics. Just call the nearest of more than 2,000 Texaco Distributing Plants, or write to The Texas Company, 135 East 42nd Street, New York 17, New York. Dept. IA-FM-11.

## LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

## Metals Lead Overall Business Improvement

Over all, business continues to improve. But while primary metals are straining to meet demand, capital goods industries are beating the bushes for orders.

This is the conclusion of the Business Survey Committee of the National Assn. of Purchasing Agents, based on their survey of members in March.

**Picture Brightens** — The group calls the new orders picture "reassuring." While 44 pct of those replying had no change, only 8 pct sagged, while 48 pct improved their new order position.

Production followed this pattern. Only 7 pct of the answers reported output off, while 47 pct were making more, and 46 pct were unchanged.

Purchasing agents are upping inventories, mostly because of the combination of strike threats, increased production, and higher commodity prices. Unchanged inventories were reported in 41 pct of the answers, but 43 pct had bigger stocks of raw materials on hand.

## Double Unemployment Pay in Ohio

Laid-off workers in Ohio can collect supplementary unemployment benefits and state unemployment compensation simultaneously starting June 19.

A new law signed by Gov. Michael DiSalle still faces one hurdle, however. As soon as it becomes effective, the Ohio Information Committee plans to challenge its constitutionality, says Fred Mulligan, executive secretary, Columbus. The committee is now in necessary legal research.

In Indiana, SUB has also been legalized by vote of the legislature, a reversal of its action two years ago. It was passed as emergency legislation to take effect immediately.

SUB became snarled in Ohio last year when about $10 million in unemployment payments was held back. The Ohio Bureau of Unemployment Compensation ruled simultaneous benefits could not be collected. The ruling was upheld by the State Supreme Court based on 1937 statutes.

## Canco Cuts Prices

American Can Co. is cutting its can prices by $1.40 to $2.26 per thousand, depending on size and style.

Company president William C. Stolk said the move would save Canco customers about $9 million in 1959. He said the reductions were the direct result of improved technology that cut their costs.

Continental Can Co. of Canada, Ltd., also cut prices.

**Canco in Canada**—The American Can Co. of Canada, Ltd., is building the Canadian metal can industry's first coil processing center.

The project is part of a $5 million expansion program. The new plant, at Hamilton, Ontario, will house high-speed, automatic machinery to shear, inspect, sort and stack virtually all the tin plate used in Canco's five Canadian container plants.

## Alcoa Owns Rome

Rome Cable Corp., Rome, N. Y., is now a wholly-owned subsidiary of Aluminum Co. of America.

Rome shareholders approved the move late last month. Total of 355,226 shares of Alcoa common stock was exchanged for Rome stock at three shares of Alcoa for five Rome.

The move will have little immediate effect on Rome customers. The present management stays. F. L. Magee, Alcoa president; and R. V. Davis, and L. E. Hickman, Alcoa vice presidents, were elected to the board of the acquired company.

## Parts Will Bear Watching

**GOOD ENOUGH?** The transparency in the viewer will tell. Timken Roller Bearing Co., Canton, O., has solved the problem of maintaining standard samples of maximum passable defects in all their components for all their visual inspectors with 3-D color transparencies. The pictures are mounted on a continuous roll in the viewer. They are quick to refer to, easy to maintain, and take up almost no valuable storage space.

## Lincoln Takes a Trambeam Tour...

# SAFE, FAST, OVERHEAD HANDLING

*Whiting Trambeam* carries Lincoln and Continental bodies *overhead*—adds a new dimension to efficient handling in the Wixom, Michigan Lincoln assembly plant of Ford Motor Company. The system is 1,500 feet long, includes 7 switches and numerous curves.

Trambeam increases production efficiency by moving loads overhead safely and with pin-point precision. Pushbutton-controlled electric hoists provide the lifting "muscle." Heavier capacities are equipped with exclusive Whiting motor drives. For complete maneuverability throughout a system, Trambeam's distinctive "half-hexagon" rail is standard size for all capacities. Each system is engineered for minimum maintenance and lowest operating cost. See how you can build new efficiency into your plant with a Whiting Trambeam Overhead Handling System.

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## Edward C. Myers

# It Takes Skill to Choose Men

**For many years, Mr. Myers has been sifting individual characteristics.**

**What he has learned may be surprising to some students of psychology.**

▪ For 25 years now, Edward C. Myers has been dealing with men and their jobs.

As vice president-personnel, U. S. Steel Corp., he has responsibility for employment, training and development, personnel resources, communications, and safety. Few men have a wider field on which to base their personnel experience.

**On Judging Men**—In his continuing search for employees, Mr. Myers has learned that there is no pat formula for choosing the right man for the right job. He refrains from classifying people into occupational types or assigning traits to potential job success.

"I have difficulty thinking in terms of types," explains Mr. Myers. "I do not feel, for example, that all good salesmen will have the same traits, characteristics or personalities."

**Applies to Managers**—And regarding managers, Mr. Myers asserts: "It is hard to find common traits for managers. The only quality they all have in common is dedication to the job. Good managers work long and hard."

Like other good managers, Mr. Myers himself has worked long and hard.

He was born in York, Pa., on Jan. 3, 1912. Football fans of a quarter century ago may remember him as Bucknell University's triple-threat, All-East halfback. "Speed" or "Killer" Myers he was known as then.

**EDWARD C. MYERS:** There is no pat formula for selecting men.

**Football Helps**—"I like to think that self-discipline, competition, and team play are all qualities that are better developed in a young fellow by football than by any other sport," he says.

He started as a trainee in the Homestead Works of U. S. Steel. He advanced through the ranks until, in February, 1958, he was appointed to his present position.

Football helped "Speed" Myers in other ways. During his early years as a personnel man he coached a sandlot eleven. It gave him an "in" with the employees. It helped him gain the friendship and confidence of the men in the shops—sometimes a tough job for a personnel man.

**Man's Unpredictability** — Mr. Myers feels initial hiring can't be foolproof.

"Selection of individuals is a hazardous occupation," he says. He feels training and development programs are necessary to provide management talent.

"It's essential that a corporation assist in developing its own management talents," he adds.

At U. S. Steel, evaluation of people for hiring or promotion generally stresses performance rather than abstract standards or psychological testing. Mr. Myers feels this emphasis on performance and development has played an important part in U. S. Steel's management.

# Its balance makes the difference . . .

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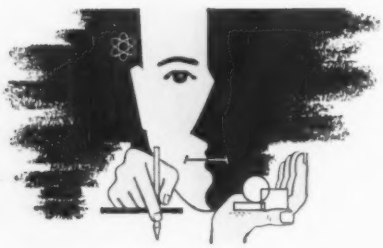

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- Electrite Tatmo*
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- Electrite TNW*
- Electrite Dynavan*

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# Backlogs Jump as Orders Soar

**The big upturn in new orders has been concentrated in steel and other primary metals. Now, it's extending across all industry.**

**Backlogs are lengthening and pace of manufacturing is helping slow inventory buildup.**

▪ The fever to get orders for metalworking products on the books is spreading. It's still concentrated in primary metals, but not entirely, by any means.

The result is that orders are well out in front of sales. Backlogs are lengthening at the rate of $1.5 billion a month in the durable goods industries.

**Like 1956**—You will have to go back all the way to November, 1956, to find a rate of new orders for manufactured products equal to February of this year. There was no letup in March, and April should see an even faster rate of placing new business.

For the record, seasonally adjusted, new orders for all manufacturing reached $29.8 billion in February. This is a gain of $1.3 billion over the previous month and a full $6.6 billion over a year ago.

**Backlogs Mount**—Although most industries are shipping as fast as they can, orders outstripped sales by over $1.5 billion during the month. This brought backlogs up to $46.2 billion for durables.

While figures are usually dull, the significance of the climb can't be missed. Orders for most branches of metalworking are coming in faster than they can be filled.

**How Much Water?**—There is no escaping the fact that a lot of the ordering is hedging against possible strikes in the primary metals. But each week the base of ordering in metalworking is widening. As it does, the danger of a collapse after June diminishes to that extent.

You should note that the Dept. of Commerce figures quoted here are already five weeks old. Demand for goods and materials even then was extending rapidly from the primary metals to fabricated parts and even consumer goods.

**Moderate Buildup**—The rate of new business has defeated to some extent the drive to build inventories. Some of the major consumers, like the auto giants, have been able to stock steel to the point where they believe they can withstand a strike of some length. (See P. 53). But some smaller buyers have not done as well.

The results show in inventory levels, which have taken no great jump this year, overall. The increase in inventories overall during February was only $300,000. Durable goods producers accounted for two-thirds of the buildup.

The total is still well below the year-ago figure of $52.8 billion, when inventory cutting was just getting under way with a vengeance.

# "Helpful" Probe Set for SBA

▪ Congress will soon take a close look at how good a job the Small Business Administration is doing in running its loan and assistance programs.

A House Small Business subcommittee headed by Rep. Joe L. Evins, D., Tenn., will conduct the study. One subject of the probe will be SBA's management of the loan laws and the new Small Business Investment Company Act. It will also look into SBA counselling of small firms.

**"Helpful" Probe** — Rep. Evins says he has received complaints of "delays, red tape, and lack of effectiveness" of both the loan and investment programs. Among other things, the subcommittee will question SBA on why some investment companies are approved, some denied, and the reasons for the delays.

The congressman says the inquiry is to be "helpful and constructive." It's designed to help SBA improve its programs. No date has yet been set. If you have comments on the SBA programs, critical or complimentary, write to the subcommittee and consider appearing at the hearings.

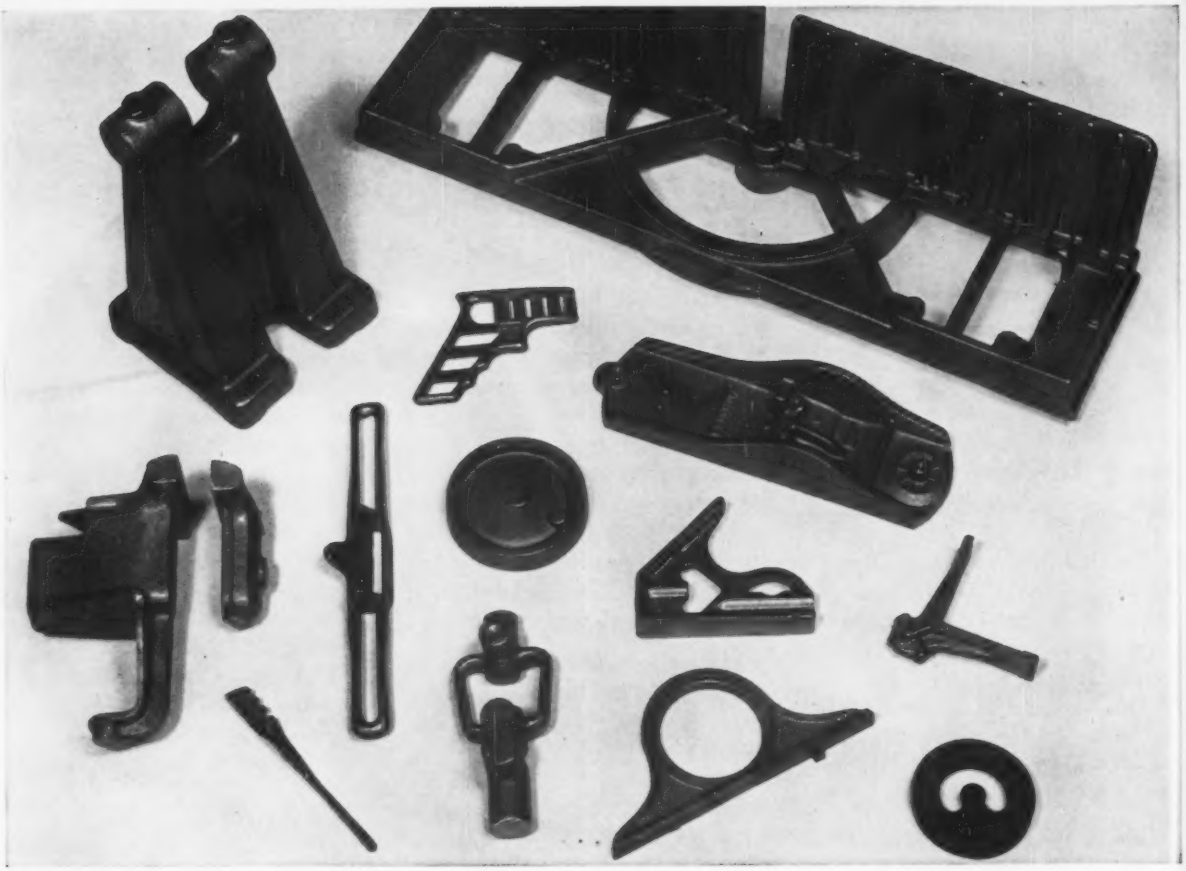
## Employees Hopeful On Labor Outlook

The employment outlook continues to improve moderately.

A Dept. of Labor survey indicates expansion of payrolls is expected in 90 pct of all employment centers.

This tends to bear out opinions of most businessmen who report they are hiring, although cautiously.

The feeling is that many companies have stretched their work force to the limit, will now have to go into the labor market more aggressively.



*Cast with Hanna iron, precision tool parts for jack planes, bench vises, saw handles and miter boxes require a minimum of machining because these gray iron castings are perfect and clean.*

# Why Millers Falls uses HANNA PIG IRON for hundreds of different precision-built tools

For more than 90 years Millers Falls Company has been manufacturing precision carpenter and machinists tools for home and industry. Some 1,500 different high quality tools are produced at the Greenfield, Massachusetts plant alone. More than 50% of the parts are made from gray iron castings containing Hanna malleable pig iron.

Many of these tools and tool parts require only shot cleaning before being assembled because of the close tolerance casting employed.

Quality, uniformity, strength and denseness, which are integral characteristics of Hanna pig iron, are reflected in the firm's record of perfect castings time after time.

Whatever you cast, large or small, there's a Hanna pig iron to do the job best. All regular grades, plus HANNATITE® and Hanna Silvery, are available in the regular 38-lb. pig or HANNATEN® 12½-lb. ingot. For the iron to suit your particular needs, call a trained Hanna representative for assistance.

*Breaker slots on glass cutter castings require no machining. Illustration shows glass cutters immediately after shakeout.*

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AN IRON AGE SPECIAL REPORT TO MANAGEMENT

# The Labor Outlook for '59— "A Pretty Rough Bargaining Year"

**The IRON AGE Interviews**—J. F. Finnegan, Director, Federal Mediation and Conciliation Service

**From his position in the center of the national labor scene, Mr. Finnegan has to view collective bargaining from an objective and impartial viewpoint.**

**In this exclusive interview, Mr. Finnegan analyzes the 1959 labor climate and the forces that make it a rough bargaining year.**

**Q. Mr. Finnegan, what is the labor bargaining outlook this year?**

**A.** This year is rapidly shaping up into a pretty rough bargaining period. We usually find the beginning of the year on the slow side, but not this go-around. On Feb. 28, 1959, we had a 62 pct increase in pending mediation assignments over Feb. 28, 1958. This is significant since historically February has always been a month when mediation assignments are at a very low ebb. And with trouble still brewing, we don't look for any letup during the next six months.

There are 150 major collective bargaining agreements covering 4.5 million workers up for negotiation this year. Each of those has its own peculiar problems and the least likely trouble area might blossom into a real donneybrook.

With the economy on the upbeat, unions will try to get a bigger chunk of the pie. But management is out to recoup a little and get a better spread of the profit margin. Management is being very cautious, because it doesn't want the inflationary finger pointed at it by the commentators in this period of "hold the line" philosophy.

**Q. Do you observe any changes in the pattern of issues that are being decided by collective bargaining?**

**A.** Wages always seem to crop up as the number one issue in disputes. But in today's bargaining, money is only indirectly the principal issue. Management's problem seems to be that of trying to get maximum production and at the same time hold the line on lower unit labor costs—e.g. stepped up efficiency of operations, better production controls, plant relocation and changes, manning problems, stiffer discipline, automation.

Labor is confronted with prob-

**MAN IN THE MIDDLE:** In Mr. Finnegan's Washington office are originals of cartoons lampooning both him and his service, above. And it takes a man with a sense of humor to take it from both sides, as his job requires.

After receiving his law degree from Fordham, Mr. Finnegan served as assistant U. S. Attorney, in the Air Force, and in private practice specializing in trial work and labor law. He was appointed to his present post by President Eisenhower in 1955.

# 1959's Union-Management Crisis

lems of job and earnings security. Especially in these periods of substantial unemployment, unions are faced with heavy demands for security. Consequently, the bargaining pattern by labor is reflected in supplementary unemployment benefits, pensions, health and welfare, severance pay, shorter work week and other protective fringes.

**Q. What are the contributing factors to this change?**

**A.** These shifts of emphasis are traceable to the economic climate. During periods of high profits, management gave in on many issues to keep production at maximum levels. Employment was high and labor was able to make big demands.

Then the recession came, profits fell, unemployment rose. Management had to economize and increase efficiency. Labor had to protect its members by concentrating on security. Technological developments are playing a key role also. Management is introducing new methods, automation is making a strong bid. Labor has to take steps to protect itself.

**Q. Do you see any easing in economic demands from unions?**

**A.** Publicly, the economic demands will probably be on the high side this year. The pickup in production, rising productivity and greater profit margins is going to give labor urgent arguments at the bargaining table.

The business background is much more favorable than last year. Many unions have already stated that they're going out for "fat" wage increases. Labor claims that increased wages would bring about additional consumer buying power which is necessary to further stimulate the economy and create demands which would put idle workers back to work.

I suspect that direct wage increases will not be far from last year's median wage increase of around 8-10¢ per hour.

**Q. What about productivity and automation? Are they becoming important as issues?**

**A.** Productivity and automation are becoming two of the most important factors in bargaining. Neither may be an actual issue in bargaining, but both bear heavily on the parties' thinking during negotiations.

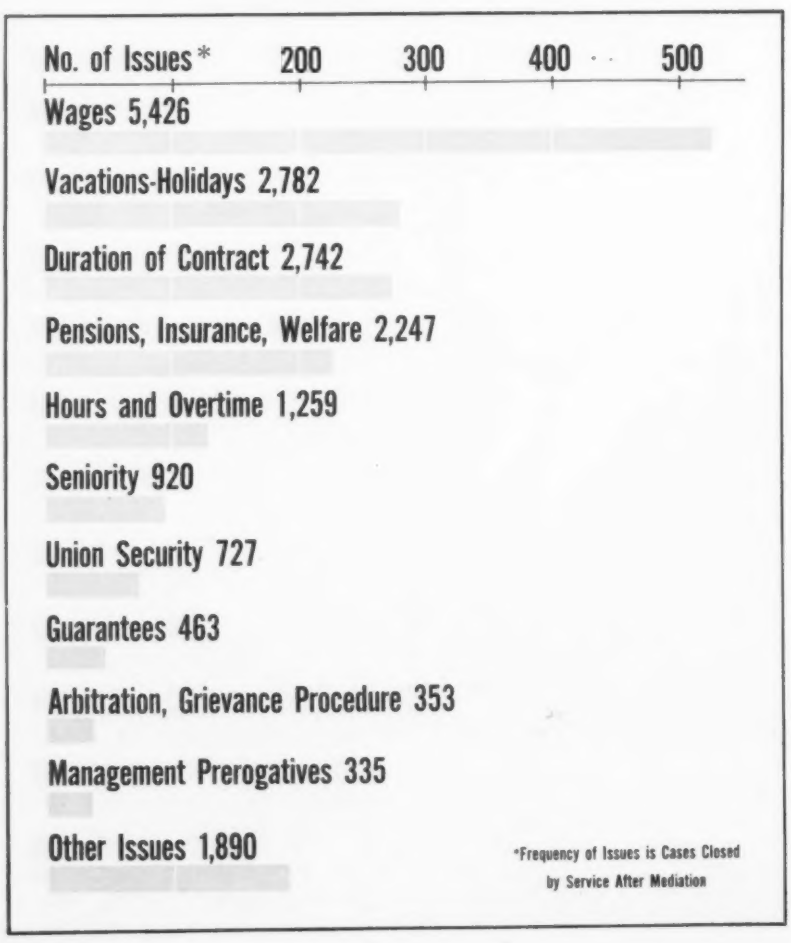
The demands from unions for greater job security and share-the-work plans stem from the fear of automation, technological advances, and rising productivity which could cut manpower needs. Management, on the other hand, is anxious to make advances in these areas in order to cut unit labor costs and raise profits.

Both factors are closely related to many of the issues that crop up in negotiations and both will probably continue to play an increasingly important role at the bargaining table.

**Q. Is the long-term contract likely to continue?**

**A.** We have seen a continuation in the trend toward long-term contracts during the past few years and I believe this trend will go on. Man-

## Issues Mediated in 1958



# In Steel: No Ultimatum, Available If Needed

**Q. Do you expect to be called into the steel negotiations this year?**

**A.** Steel negotiators on both sides of the table represent some of the most skilled and mature bargainers in the business. These people are well aware of the complexities of their industry and the economy as a whole.

They have been preparing for this round for the past three years and I expect both sides are loaded for bear.

But each side is also fully cognizant of its responsibilities to the nation, the workers, and the stockholders and I believe that a mutually satisfactory agreement will come out of conscientious bargaining.

We will make full and adequate mediation facilities available to the parties, if needed.

We have been following all the reports on this one from the beginning and will continue to keep abreast of developments. However, the government isn't prepared to issue any ultimatums. Our role, if it's necessary to have one, will be that of impartial mediator.

agement seems to prefer the longer contracts because they can plan on fixed expenditures and the unions are inclined to view these as less objectionable than some other issues.

Often labor will give in on long-term in order to salvage other important issues. Also, with the unions' present concern over security issues, it appears that long-term contracts may have less of a bitter taste than previously. I doubt that we'll see much if any of the old 5-year contracts. But the 15-month, 2-year and even a few 3-year contracts will probably continue.

**Q. Are skilled workers the forgotten men in labor negotiations?**

**A.** The demands of skilled workers have made some headway in contract negotiations recently, but by and large they have been "the forgotten men." The construction of the industrial unions makes this unfortunate situation so. The skilled tradesmen represent only a fraction of the union and the democratic union must speak for the majority.

However, pressure from skilled workmen is beginning to result in new bargaining units composed of skilled members rather than workmen of all skills in a common bargaining unit. This has tended to make bargaining much more complex and if these demands continue, the skilled worker will emerge in a new light.

**Q. How do you account for the low strike rate in 1958, a year when many predicted severe labor troubles?**

**A.** Every indicator pointed to a hectic labor relations scene last year. Bargaining started out rather vigorously. Unions set up ambitious programs and announced that they were prepared to resort to economic pressure to achieve their objectives.

Management said it was just as determined to keep cost down and seek more efficient operating methods. These announcements led most people to conclude that severe labor trouble would develop in our then blue-skied economy. When the national economy started to dip, a reappraisal by both sides was imperative.

Responsible labor and management representatives recognized the danger of protracted labor difficulties during this period of recession and both made significant efforts to keep production at maximum peaks and strife at minimum levels. Concessions were made by each side to accommodate the mutual needs of the employer and employees. Problems were settled at the bargaining table through sound collective bargaining principles.

One other factor that may have had an effect on the low strike rate was the public controversy over internal union affairs. Because of charges of improper activities against a few unions, the entire labor movement was unduly threatened by public opinion. This may have had some effect on reduction of strikes just as the period of debate over the Taft-Hartley Act saw less strike activity.

In general, I believe four factors contributed to this relatively calm labor relations year: The economic recession, maturity of labor and management representatives, the soundness of our collective bargaining system, and the public controversy over internal union affairs.

**Q. How many disputes came before the Service last year? How does that compare with other recent years?**

**A.** There were 6490 actively mediated. By this I mean that mediators conducted meetings and actively participated in the bargaining negotiations of 6490 disputes. There were an additional 10,733 cases which came to our attention and into which a mediator made inquiry and kept in touch with the parties, even though he didn't actually sit in on the negotiations.

These figures have been running fairly stable over the past few years, but this year looks like a heavier case load than any recent year.

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**Reprints** of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

# Is heat treating costing you more than it should?

## A FRANK APPRAISAL OF YOUR METHODS MAY WELL BE IN ORDER!

Every so often, it pays to re-evaluate every production phase in the light of new developments. This is especially true of heat treating. A method change here or a piece of more modern equipment there can spell vitally important cost savings . . . a fact that Ajax has proved in hundreds of cases.

The outstanding basic advantages of salt bath heat treating for most applications are now, of course, well known. These include: faster, more uniform heating by conduction; elimination of atmosphere problems; negligible distortion; ease of selective heating; faster production in less space with unskilled labor; and various others.

Not so well known, however, are important recent developments in salt bath furnace types. The new Ajax design in which a pair of submerged electrodes can be changed in a short time without tearing down the pot is an example. Ajax Cataract Quench Furnaces which give molten salt quenching power equal to that of oil are another. Ajax gas-fired salt baths are still another.

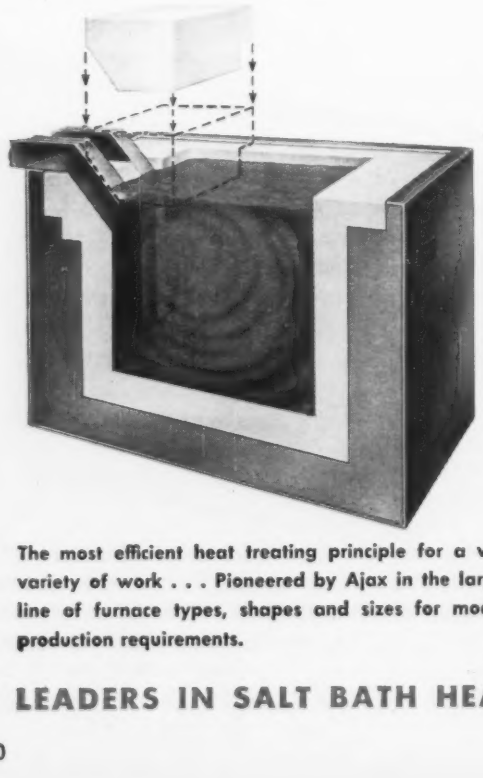
*Equally important, there have been 10 league strides in applying salt bath processing to still better advantage and in mechanizing it for substantial labor cost reductions.*

As salt bath pioneers and with connections in many parts of the world, it is only natural that Ajax should have led in most of these while being thoroughly familiar with all.

The chief product of Ajax is heat treating "know how" . . . not merely the largest assortment of salt bath furnace types on the market.

Thus Ajax heat treating specialists welcome the opportunity to make recommendations from the background of their unsurpassed experience. While freely admitting that salt baths do not answer every need, they work on the demonstrable knowledge that Ajax Salt Bath Furnaces are scoring important cost reductions on an ever-increasing list of applications while materially boosting quality and efficiency on many.

No obligation is entailed in having Ajax make a frank appraisal of your heat treating situation.



**The most efficient heat treating principle for a wide variety of work . . . Pioneered by Ajax in the largest line of furnace types, shapes and sizes for modern production requirements.**

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**SALT BATH FURNACES**
Internally heated.
Electric and gas fired types.

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# Is Horsepower Really a Killer?

## New Study Exposes Other Causes of Road Accidents

**Some of the blame has been lifted from high-powered engines by the Bureau of Roads.**

**Old cars show up as an important contributor to the high death rate.—By H. R. Neal.**

▪ Speed and horsepower may not be the killers many people have accused them of being.

A three-year study on highway safety by the Bureau of Public Roads has implicated other culprits in murder on the highways. Among them: Older cars, poor highways, darkness, and driver fatigue.

**Industry Is Interested** — Automakers are paying close attention to what the Bureau of Public Roads has to say. In recent years, the government and private groups have been putting pressure on the industry to play down horsepower and speed in its new models.

The Bureau's 400-page report, prepared for Congress under direction of C. W. Prisk, analyzed 3.7 billion vehicle miles by 29,000 drivers. It studied accidents involving 10,000 vehicles. New techniques for accident study were used in 11 states on 35 sections of typical main and rural highways totaling 600 miles.

**Fallacy Uncovered** — For one thing, the safety warning "Speed Kills" is at best only partially true. Drivers traveling at speeds under 40 mph, the report shows, were involved in accidents at a rate several times higher than those traveling at faster speeds. Lowest daytime accident involvement rate was for speeds between 55 mph and 70 mph.

However, the average driver fails to slow down at night. Day and night average speeds were found to be about the same. Involvement rate below 70 mph was twice as high as in daytime, while it was four times greater at speeds of 70 mph and above.

**Wee Hours Worst** — Darkness itself was not necessarily the main reason for higher accident rates. Peak accident rate was reached between 2 a.m. and 4 a.m. It's less than half as high between 9 p.m. and 11 p.m. Intoxication, fatigue, and other factors are credited with the difference.

A point of particular interest to automakers criticized for higher and higher horsepower engines: Low horsepower cars show an exceptionally high accident involvement rate.

**Jalopies Are Dangerous** — The rate also grows progressively worse as the age of vehicles increases. Cars less than two years old are driven 50 million miles per fatal accidents. Those more than eight years old are driven only 21 million miles per fatal accident.

The reports say present automobiles are "structurally safer than any that have heretofore been manufactured and the industry is giving increasing attention to many features of that vehicle that add to its safety."

**A Few Weak Spots**—But it also

## Just for Looking, Not for Buying

**JOURNEY BEGINS:** A new 1959 Pontiac Bonneville Vista, one of six General Motors cars to be displayed at the American National Exhibition in Moscow, is loaded aboard a freight car at plant in Pontiac, Mich.

pointed out there are "residues of weakness in automotive design and function." Specific criticism was leveled at inadequate windshield wipers, defrosting and defogging equipment, including rear windows, and suggested improvements could be made at modest cost.

The report notes vehicle lighting has improved in recent years, along with signalling to denote braking, turning and backing. Dual headlamps and heavy duty electrical systems, it suggests, might lead to polarized headlighting.

**Low-Look Problem** — Brighter rear lighting aids identification greatly, but points out that the lower positioning of these lights partially offsets the safety advantages. Suggestion: Greater standardization and improvement for safety purposes instead of continued manipulation for appearance purposes.

Another shortcoming in modern cars: Controls and instruments appear to have had only limited consideration from the viewpoint of safety.

Sharp hood and fender ornaments and projectile-like bumper guards were criticized as nonfunctional and hazardous. The report praised greater visibility through greater use of glass, but pointed out tail fins block rear vision in backing up.

**Braking and Skidding** — Better brakes are needed by all cars, with particular attention being given to anti-skid devices. Skidding, the report says, is a "far more serious factor than is generally realized." However, it points out smooth sections of road surface could also be given non-skid surfaces as part of routine maintenance operations at a low cost.

Age of the driver is a significant factor in accident involvement, too, the study shows. Drivers between the ages of 30 and 60 have fewest accidents. Those under 20 the highest — 2.5 times as many as the average for all drivers. While the accident rate for those between 20 and 24, and over 60 years of age double the average for all drivers.

## The Bull of the Woods

RIGHT THERE IS A PICTURE OF A FAILURE IN LIFE-- THAT OFFICE KID READIN' A CHEAP NOVEL, WHEN THEM OFFICE PAPERS HE'S CARRYIN' WOULD DO HIM FORTY TIMES MORE GOOD!
WELL, THEN, THAT GUY WID HIS SNOOT IN 'EM OUGHTA HAVE A GREAT FUTURE AHEAD O' HIM, EH?
NO, HE'S TOO LATE! THAT KID'S AT TH' RIGHT AGE FER NOSINESS, BUT DON'T DO IT--TH' OTHER GUY IS TOO LATE, BUT DOES A LOT OF IT!
THE COMER

**Automotive Production**

| WEEK ENDING | CARS | TRUCKS |
|---|---|---|
| Apr. 4, 1959 | 133,965 | 25,790 |
| Mar. 28, 1959 | 121,832 | 25,535 |
| Apr. 5, 1958 | 64,318 | 16,888 |
| Mar. 29, 1958 | 93,844 | 17,665 |
| TO DATE 1959 | 1,683,326 | 322,883 |
| TO DATE 1958 | 1,290,587 | 240,611 |

*Preliminary Source: Ward's Reports

**Turnpikes Safest** — Superhighways were found to be the safest. Controlled access highways were 2.5 times safer than ordinary highways, some of the best sections are as much as five times safer than the national average for all highways.

## Electric Cars Draw More Interest

More companies are showing a spark of interest in the electric auto (The IRON AGE, Mar. 5, p. 53).

American Motors and Sonotone Corp., Elmsford, N. Y., have announced a joint, long-range development project "to explore the possibilities of a revolutionary electric automobile."

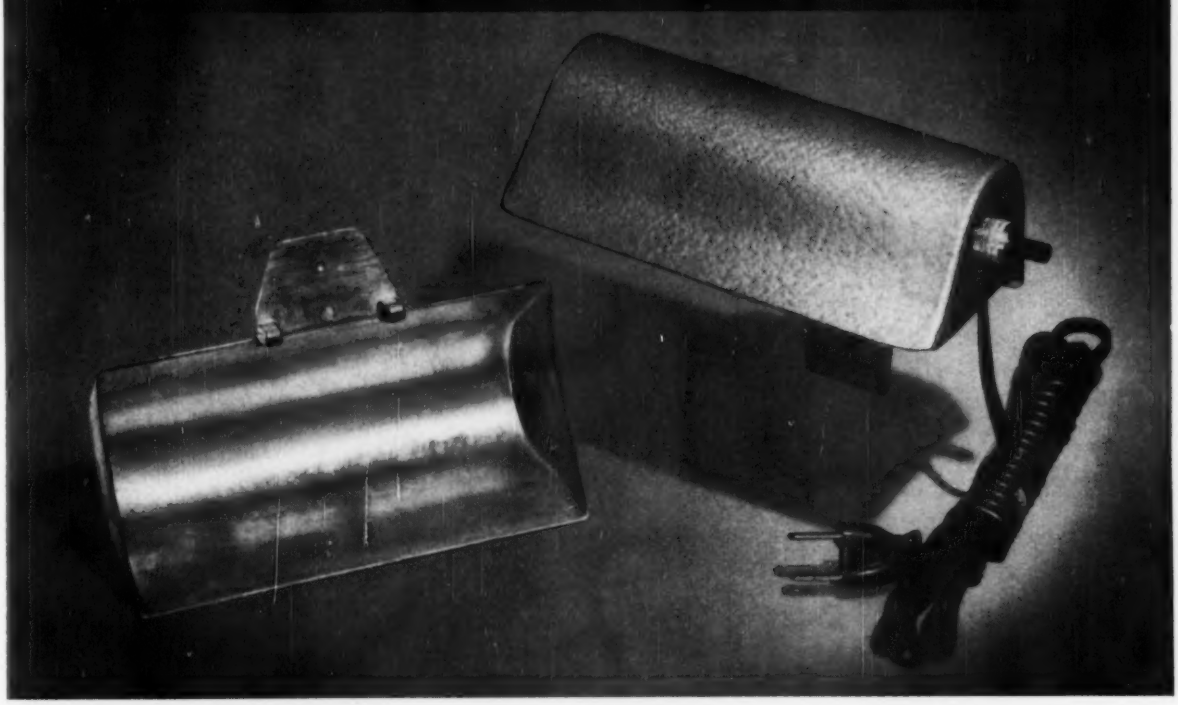
**Nickel-Cadmium Heart**—Aim of the project is to develop an electrical powerplant which would be constantly recharged during operation by a generator operated by a small high-performance engine.

"Heart" of the vehicle will be a sintered-plate, nickel-cadmium battery. This type of battery is smaller and lighter than conventional batteries of comparable energy output.

**Long Life Advantage**—While it costs substantially more to produce, the battery can withstand great overload or surges of power. It can be recharged "in a fraction of the time of conventional batteries," Sonotone said. It also has a long life and the original battery is expected to last the life of an auto.

The joint project, "which could take several years," will take place at plants of both companies. It was launched "to see if a more economical automobile might result," the companies said.

# IT'S LIGHTER THAN YOU THINK!



## AND EASY TO ASSEMBLE WHEN DIE CAST WITH... ZAMAK

The shade for this new KLIP-LITE* music stand is made of a single thin-wall zinc die casting—for light weight and low-cost assembly. As thin as a stamping but with far greater rigidity, the contours could not be duplicated in sheet metal.

By designing for die casting, only 4 holes are needed before spray finishing and assembling the socket-switch and mounting bracket.

These extremely thin wall sections—possible only with ZINC die castings—minimize weight and are stronger in proportion to thickness than heavier sections.

Parts designed for ZAMAK alloy die casting will meet competition of either stampings or aluminum castings—and at lower cost.

*Made by WIESE MANUFACTURING COMPANY—Davenport, Iowa.

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# Speak Now on Renegotiation

## Hearings Will Determine Whether to Extend This Law

**Administration is for it, with a few changes.**

**Here's how industry with something to say can make itself heard.—By G. H. Baker.**

▪ If you believe renegotiation of defense contracts can be improved, now is the time to speak up. The government's authority to renegotiate all but the smallest contracts and subcontracts expires June 30.

**The Eisenhower Administration is asking Congress to extend the law—with some improvements for 27 months, to Sept. 30, 1961.**

Public hearings on the matter will open in Washington on April 27. The hearings will be held by the tax-writing House Ways and Means Committee. Anyone wishing to either testify in person or submit written views should consult Rep. Wilbur D. Mills, Chairman, Ways and Means Committee; U. S. House of Representatives, Washington, D. C.

**How to Improve It** — The Defense Department admits the present renegotiation law is not perfect. The Department is suggesting several changes to assure that:

**Contractors are not deprived of profits resulting from improved plant efficiency.**

**Tax court decisions involving renegotiation may be reviewed by higher courts.**

### Stormy Nomination

President Eisenhower's nomination of Stuart Rothman to become general counsel of the National Labor Relations board is touching off some explosions in Congress.

Mr. Rothman, 44-year-old solicitor of the U. S. Labor Department, is drawing bitter opposition from conservatives, including Sen. Barry M. Goldwater (R., Ariz.), as well as from Democrats. Sen. Goldwater and other conservatives are fighting Mr. Rothman as too liberal. (Officially they say he isn't qualified for the post).

Democrats see a chance to embarrass Labor Secretary Mitchell by hammering away at his pick for this powerful post. As NLRB general counsel, Mr. Rothman would have absolute power to decide whether a charge of unfair labor practices will be presented to the NLRB.

### Ponder Tax Guide

A guide to help state governments set up rules for taxing out-of-state concerns is being explored by Congress.

Senate Small Business Committee is holding hearings to find how state taxes affect companies engaged in interstate commerce. Small firms have been urging this since the U. S. Supreme Court ruled favorably on state taxing practices. (The IRON AGE, March 5, 1959, p. 40; March 12, 1959, p. 92).

**Who Is Affected** — Thirty-five states now tax corporate earnings. But the question of taxing the in-state earnings of out-of-state firms has not arisen in every one of these.

It may help, the Senate committee believes, to develop a uniform procedure for states. This would at least offer taxed companies a clue to the percentage of income on which a state might tax them.

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# Rickover Raps Committees

**Fie on Togetherness**—Pentagon committees are a blight on the nation's defense efforts, says Vice Admiral Hyman G. Rickover, nuclear planner. His advice to young officers: Stay away from them.

**The Army, Navy, and Air Force are riddled with useless committees that talk, talk, talk, and contribute nothing of substance to national defense, Rickover complains.**

He grimly predicts, one day the entire Defense Department will be taken over by these committees and "nobody will be doing any real work."

Trouble with these so-called planning committees is that they have no responsibility for executing their own recommendations. Members solemnly turn out silly recommendations, then "cheerfully retire and get on some other committee," he explains.

**Organized Time Wasting**—Rickover cites this recent example of wasted effort: A committee spent three months talking about submarine propulsion. At the end of this period, it made this recommendation: The Navy should look into a new type of power plant for subs, if one is developed.

**The admiral exploded: "Do we need 60 people meeting three months to tell us if there's a better mousetrap we should buy it?"**

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# BRISTOL BRASS STRIP

If you use Brass strip, Bristol will furnish the exact temper and grain-size best suited to the fabrication of your product.

Uniformity of gauge . . . combined with consistent adherence to close width-tolerances . . . will please the most exacting operator.

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# Boeing Plans for Space Age Sales

## New Projects Will Boost Seattle's Economy

**There are ambitious plans at Boeing aimed at keeping company well up in race for space age business.**

**They include a contract to study how an observatory can be built on the moon.**

**Work also underway on man-carrying space glider — the Dyna-Soar.—By R. R. Kay.**

▪ Who'll be first on the moon?

In Seattle, it's not so much a question of the U. S. vs Russia. It's Boeing vs other U. S. plane and missile makers who also have their eyes on the sky.

George H. Stoner, general manager of Boeing's Dyna-Soar program, confirms that his company has a government contract to study how to put an observatory on the moon.

**Seattle Will Benefit**—The lunar-observatory project is just part of Boeing's large space-age program. This, it is felt, will give a terrific boost to Seattle's economy within a decade.

Mr. Stoner can't give out details of the project. But his discussion of "strategic orbital systems" makes it clear that Boeing is watching the man in the moon closely for a clue on its future.

**Working on Tomorrow** — The company just dedicated a $30 million Developmental Center—one of the largest under-one-roof buildings on the West Coast.

It's a 41-acre structure, described as "a massive laboratory where tomorrow is taking shape."

**Gliding Through Space**—Boeing is keeping a dead silence on the point. But it's believed that the company has already built a mock-up of the Dyna-Soar.

This is a man-carrying space glider. Boosted into the air by powerful rockets, it would orbit the earth like a satellite, and make a conventional plane landing on its return. Its orbit speed: 17,000 mph.

### Structural Sales Rise

Structural steel fabricators on the West Coast can look for a 10 pct hike in business this year. And next year will be even better.

That's the forecast of Wallace R. Harper, assistant executive vice president of the American Institute of Steel Construction.

The Farwest consumed 202,000 tons of structurals in 1958. With industrial building on the rise, Mr. Harper's prediction could be conservative.

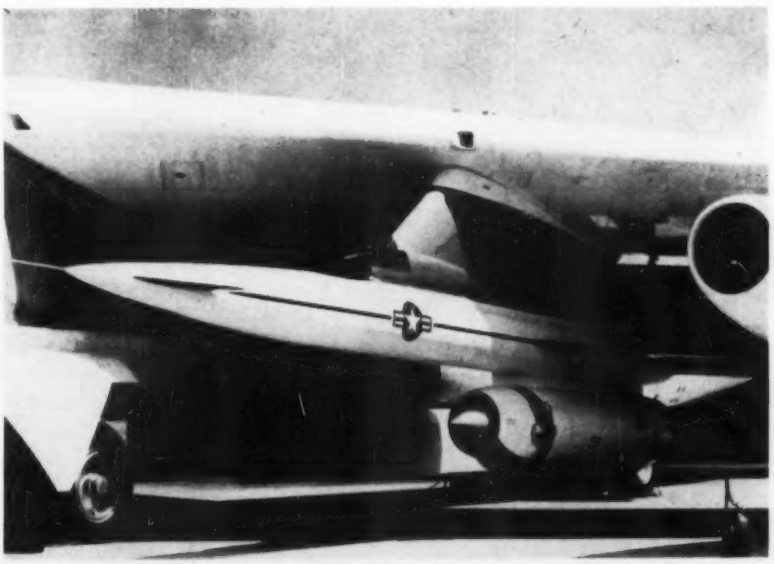
### Iron Ore for Japan

Iron ore exports will soon be a major industry in British Columbia.

Latest figures indicate that by midsummer exports may be at the rate of $30 million to $40 million per year.

Mimpkish Iron Mines, Ltd., with properties in the Mimpkish Lake region of Northern Vancouver Island, will begin shipping ore to Japan in July. The company is spending $2 million on a building program.

## Hound Dog Will Aid B-52's Hunting



**AIR-TO-SURFACE DESTROYER:** Test model of North American GAM-77 missile (better known as Hound Dog) is hung on wing of B-52 bomber. Missile will take off from this position when airborne and fly to a selected target, extending B-52's normal operating range.

# new tracer from LeBlond!

# REGAL TRACE

## new principle, new design, new convenience, new price... as low as $2760!

Now, simply by adding Regal-Trace, you get all the advantages of tracer lathe production with your present LeBlond Regal and Dual Drive Lathes. Easy, fast, accurate—Regal-Trace gives your lathe low cost duplication of parts for high production turning. Prices begin as low as $2760 for the 13″ Regal model.

Easy to use—Operates from easily prepared flat templates. Traces radii, stepped shafts, contoured faces, tapers, compound and spherical curves. Simple to set up. Can be installed in less than 15 minutes. Self-contained—only 4 major parts, all mounted on lathe. Hydraulic unit becomes an integral part of the machine (does not interfere with normal lathe operation). Tracer unit quickly replaces compound rest.

Fast and accurate—Locked-circuit hydraulic system produces exceptional responsiveness and precision. Regal-Trace will consistently duplicate part after part to accuracy of ± .0005″. Feed rate of 75″ per minute keeps up with speediest cuts. Fits any LeBlond Regal built since 1955, and all Dual Drives. Regal-Trace is the ideal lathe attachment for tool room or production turning. See your LeBlond Distributor or write today for complete information. Ask for Regal-Trace Bulletin.

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# Needed: New Facts on Machining

## Knowing Why Some Techniques Work Could Save Money

**A new ASTE report throws the spotlight on the crying need for more facts on machining.**

**And the authors tried to blaze the trail for future probers. —By E. J. Egan, Jr.**

▪ Despite all the machining done in this country, relatively few people really know why certain metal cutting techniques work as they do.

Some say they haven't the time to find out. This is false economy, of course, because trial-and-error time really adds up. Then too, if you don't know "why," you don't know for sure if you are getting ultimate results.

**In the Dark**—Others, well motivated, haven't been much better off. They have been groping in the darkness of no facts. Even where work had been done there is often conflict of theories.

A new research report published by the American Society of Tool Engineers points up the crying need for work in this field. No one is likely to argue with their case: That a clear understanding and wider application of metal cutting facts can only lead to better and more economical machining everywhere.

The ASTE report is no pamphlet. It's a 275-page volume, the end product of a $37,600 project.

**The title it bears it richly deserves: "An Evaluation of the Present Understanding of Metal Cutting." It's a landmark in a field of metalworking that involves many billions of dollars annually.**

**Sources Exhausted** — To compile the report, a nine-man team of author-experts from Battelle Memorial Institute sifted through virtually everything that has ever been published on metal cutting. The team's director was F. W. Boulger, chief of the Institute's ferrous metallurgy division.

Various sections of the volume boil down all that is known or theorized about such subjects as:

**The Mechanism of Chip Formation.**

**Thermal and Physical Aspects of Cutting.**

**Wear and Life of Single-Point Carbide Tools.**

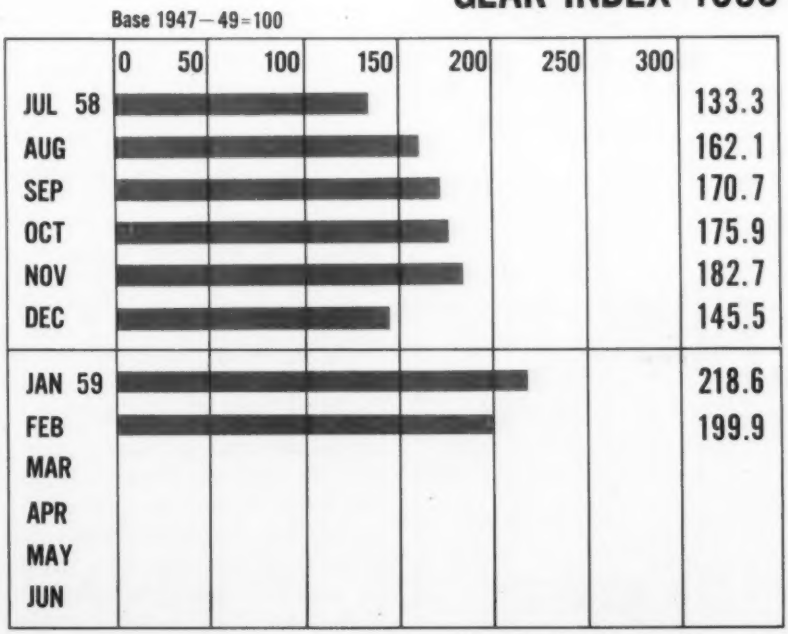
**Present Knowledge of Cutting Fluids.**

**Influence of Metallurgical Properties on Metal Cutting.**

Having established the present state of the metal cutting art, the volume takes an even more significant step for each of the fundamental phases it deals with. It offers conclusions about what has been achieved to date, and makes recommendations on future research.

**How to Proceed Further**—Moreover, the men who waded through mountains of material to present this evaluation have some suggestions for tomorrow's investigators and authors. They urge broader studies of metal cutting principles. And they feel that scientific findings should be presented in terms that engineers can readily understand.

## GEAR INDEX 1959




Source: American Gear Manufacturers Assn.

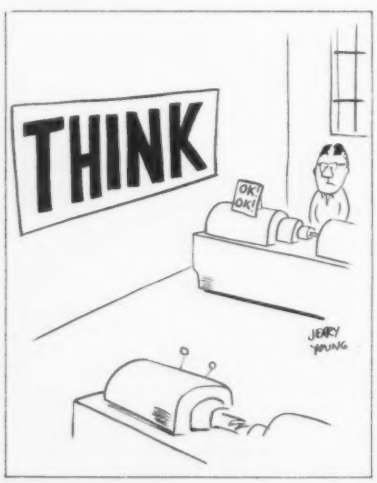
## INDUSTRIAL BRIEFS

**Foundry Course** — Metals Engineering Institute, Div. of American Society for Metals, is sponsoring a course on "Steel Foundry Practice." It is available to individuals for home study, industrial groups, or educational organizations for classroom study via in-plant or group training sessions. The catalog of 17 metal courses is available from EMI, Dept. FS-2, 7301 Euclid Ave., Cleveland.

**Wire Deal**—Acme Stamping & Mfg. Co., Pittsburgh, has acquired the wire-forming facilities of Townsend Co., New Brighton, Pa. All equipment, tools, dies and drawings have been transferred from New Brighton to the Acme Pittsburgh plant.

**Missouri to Rhode Island**—Key personnel and plant equipment of the Madison-Faessler Co., Moberly, Mo., will be moved to the Providence R. I., home of their parent company, Madison Industries, on or about May 1 of this year.

**Production Institute** — The first annual Production Institute will be held at the Campus Activities Center, University of Wichita Campus, Wichita, Kan., May 4-5. The theme is "Grooming Production for this Space Age." It is being sponsored by the American Society of Tool Engineers, Chapter No. 52 and Student Chapter No. 14.




**Zirconium Assn.** — A group of companies that produce, melt, and process zirconium have formed the Zirconium Assn. The association office is located at 2130 Keith Bldg., Cleveland. Mr. W. B. Thomas of Thomas Associates, Inc., is executive director.

**Instrument Rental** — General Electric has formed a pool of 13,000 instruments for loan to business, industry and individuals. The new instruments rental service was organized through the company's cross-country network of 55 service shops, providing instruments for more than 70 different kinds of measurement.

**Snyder Buys Hope** — Snyder Corp., Detroit, has acquired the Hope Machine Co., Philadelphia builder of filling machines for packaging processes. The Hope machines will be engineered and built in Michigan plants of Snyder Corp.'s Arthur Colton Co. Division.

**Branching Out**—The Thompson-Ramo Wooldrige Products Co., has established European and Eastern United States sales engineering offices. W. A. Bridges, has been appointed to head the European office located at 7, Avenue George V, Paris. R. M. Hexter is in charge of the U. S. office located at 200 E. 42nd St., New York.

**Zero Buys Stock**—Zero Mfg. Co., Burbank, Calif., producers of metal enclosures and packaging for the electronics and missile industries, has acquired 95 pct of the stock of White Aircraft Corp. of Palmer, Mass. J. M. White will continue as president of The White Div., operating as a subsidiary.

**Oil Reservoir** — Construction of more than a million barrels of tank storage capacity at Seymour, Ind., to provide a vast Midwestern reservoir for domestic burner oils for two major shippers, has been started by Texas Eastern Transmission Corp. These tanks will make burner oil available to consumers in the Midwestern and Central states served by the Little Big Inch Div.

**New Warehouse** — Adam Metal Supply Inc., Long Island City, N. Y., has opened a warehouse at 520 York St., Elizabeth, N. J. It brings to New Jersey every standard size, shape, gage, and alloy of Alcoa aluminum. Adam Metal's policy of 24-hr deliveries will be maintained.

**Plating License Sold**—The Steel Improvement & Forge Co.'s new subsidiary, Sifco Metachemical Inc., has acquired the business and assets of the parent company's Electro-Chemical Div. It has purchased licensing rights in Canada and the U. S. for a specialized plating technique known as the Dalic Process, previously owned by Dalic Metachemical Ltd., Toronto, Can.

**Stock Split** — Stockholders of Eastern Stainless Steel Corp., approved a charter amendment increasing the authorized shares of common stock from 1 million shares to 3 million and splitting each outstanding share of common stock of the par value of $5 per share into two shares at the par value of $2.50 per share.

**Second Expansion**—Fluid Regulators Inc. of Painesville, O., designers and manufacturers of hydraulic and fuel valves, have completed a second plant expansion program in three years. The expansion involves a 30 pct space increase for engineering offices, test and experimental laboratory.

**Corporate Change**—Colt "Rite-Size" corrugated box machinery and auxiliary equipment is now being sold and serviced by Colt Packaging Machinery Co., Cranston, R. I. The newly-formed company has purchased the assets of the former box machinery and equipment division of Colt's Plastics Co., Inc., of Hartford, Conn.

**Mill Order**—The Wisconsin Steel Div. of International Harvester Co., Chicago, has ordered the rolling mill equipment for its new $12 million merchant mill from Loewy-Hydropress Div. of Baldwin-Lima-Hamilton in New York.

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## The most versatile valve your supplier has on hand

The ACF Lubricated Plug Valve demonstrates its versatility by operating efficiently and economically in a wide range of service applications: in chemical plants, sewage and water works, paper mills, oil field production, refining, mining operations, coke plants —it's a long list.

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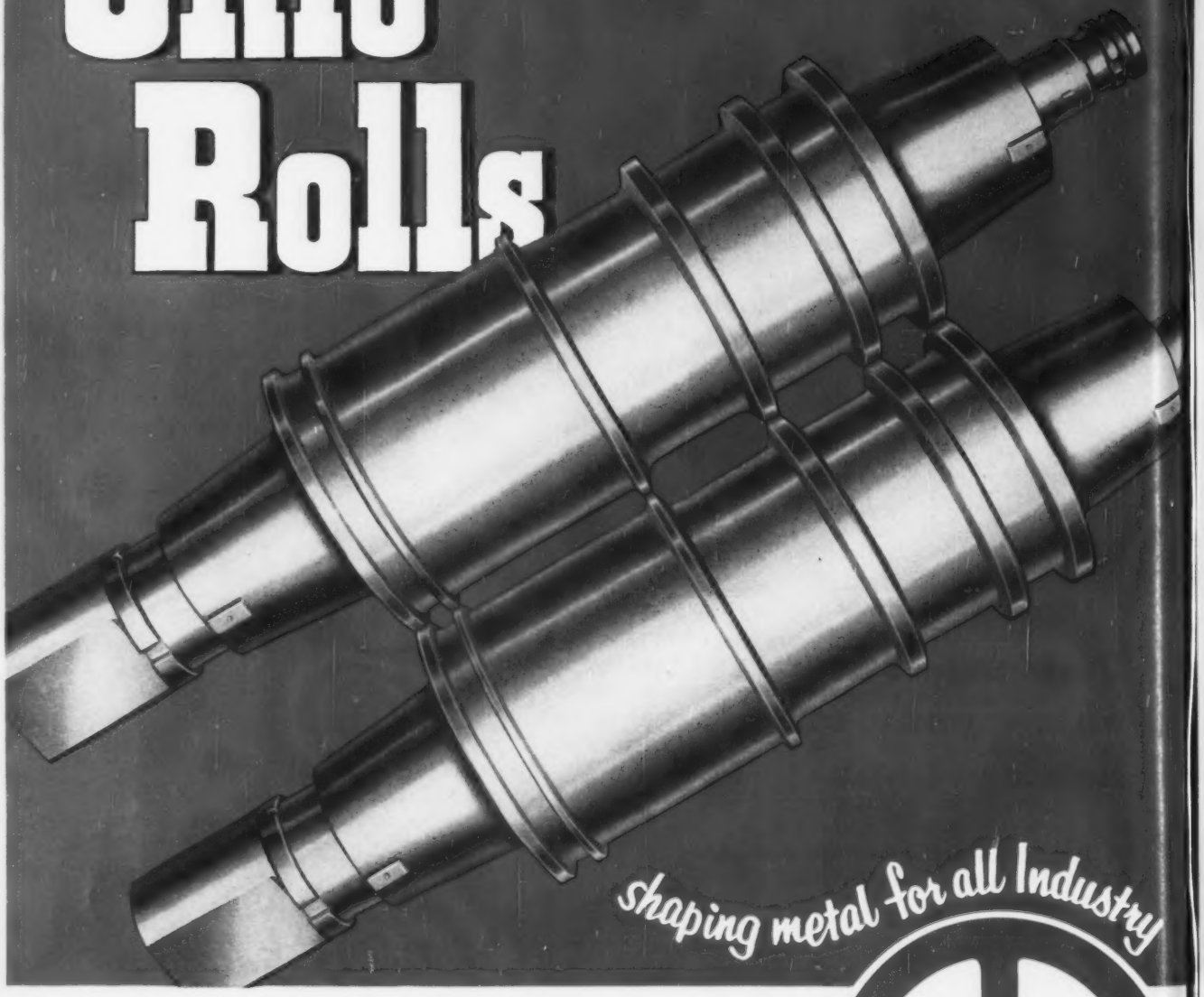
# Ohio Rolls



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| Carbon Steel Rolls | Flintuff Rolls | Denso Iron Rolls |
| Ohioloy Rolls | Double-Pour Rolls | Nickel Grain Rolls |
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| Nioloy Rolls | Forged Steel Rolls | |

## The Ohio Steel Foundry Co.

LIMA, OHIO

*LIMA... Virtually at the center of the steel industry*

PLANTS AT LIMA AND SPRINGFIELD, OHIO

**L. S. Hamaker,** appointed assistant vice president, sales, Republic Steel Corp.

---

**C. W. Wesson,** elected president, Eastern Machine Screw Corp., New Haven, Conn.; **C. W. Bettcher,** elected chairman of the board.

**L. M. Cole,** elected vice president, sales, Warner & Swasey Co., Cleveland.

**F. J. Pickett,** appointed vice president, The Purdy Co. at Long Beach, Calif.; **T. E. Duffy,** named vice president at South San Francisco.

**R. M. Miller,** promoted to vice president and general sales manager, Onsrud Machine Works Inc., Niles, Ill.

**A. S. Cook,** has joined the industrial relations staff of Republic Steel Corp. as a labor attorney.

**A. R. Putnam,** appointed managing director, American Society for Metals, Cleveland.

**L. A. Curnoe,** elected treasurer, Brooks & Perkins, Inc., Detroit.

**R. L. Carbeau,** elected president, Universal Mfg. Corp., Zelienople, Pa.; **A. M. Capper,** appointed to the board of directors and will serve as chairman of the Executive Committee.

**C. W. Sisco,** appointed district manager, Pittsburgh sales office, Surface Combustion Corp., Toledo, O.; **R. M. Snyder,** named district manager, Steel Mill Div., Chicago (Park Ridge) office and **R. E. Strutner,** sales engineer, Toledo, Steel Mill Div.

**T. A. Sandstrom,** appointed assistant Division manager, Kolcast Industries Div. of Thompson Ramo Wooldridge Inc., at Minerva, O.

**Louis Lovisek,** named manufacturing manager, Parker-Kalon Div., General American Transportation Corp., Clifton, N. J.; **Harold Rosenberg,** named plant manager, and **Ed Holmes,** promoted to planning manager; **Herb Rodaman,** named asst. general manager for purchasing, accounting and industrial relations.

**R. C. Gilmore,** appointed chief accountant, B-G-R Division at Plymouth, Mich., Associated Spring Corp., Bristol, Conn.; **J. A. Redman,** becomes accounting manager of the B-G-R Div.

**E. D. Mesta,** promoted to assistant sales manager, Mesta Machine Co., Pittsburgh.

**S. A. Crabtree,** named general manager, sales, Republic Steel Corp.

---

**R. C. Bryan,** named manager, Systems and Procedures Dept., Youngstown Sheet & Tube Co., Youngstown, O.

**H. R. Brown,** appointed sales manager, "PAYLOADER" Div., The Frank G. Hough Co., Libertyville, Ill.

**R. T. Steindorf,** will become director, research and development,

**(Continued on P. 85)**

**R. L. McIlavy,** promoted to manager, machinery sales, Mesta Machine Co., Pittsburgh.

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AL

(Continued from P. 83)

Chain Belt Co., Milwaukee; **William Sivyer,** named manager, Conveyor and Process Equipment Div.; **W. W. Dawson, Jr.,** becomes Central and Southern regional manager, Milwaukee.

**B. P. Doty, Jr.,** appointed general sales manager, American Steel & Wire Div., U. S. Steel Corp., Cleveland.

---

**W. L. Nopper,** appointed district manager, New York sales office, Roots-Connersville Blower Div. of Dresser Industries, Inc., Connersville, Ind.

**W. I. Poll,** appointed sales manager, Steel Products Div., Kerotest Mfg. Co., Pittsburgh.

**C. H. Wyman,** appointed manager, Alloy Div., Exomet Inc., Conneaut, O.

**S. C. Prest,** named vice president and general manager, Griffin Wheel Co., Chicago, a subsidiary of American Steel Foundries.

**Frank Marold,** named vice president, sales, Griffin Wheel Co., Chicago, a subsidiary of American Steel Foundries.

---

**J. D. Shircliff,** appointed regional automotive sales manager, Reynolds Metals Co., Detroit.

**R. C. Bryan,** named manager, manufacturing and **A. C. Schliewen,** works manager, The White Motor Co., Cleveland.

**W. H. Johnson,** appointed New York district sales manager for Western Brass sales, Metals Div., Olin Mathieson Chemical Corp.

**O. L. Dean,** named manager, operations, Griffin Wheel Co., Chicago, a subsidiary of American Steel Foundries.

---

**C. S. Mehelich,** appointed abrasive sales engineer, Pangborn Corp.

**M. P. Groom,** named branch manager, El Paso sales office of

**(Continued on P. 88)**

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*. . . every fastener need*

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These three are Pittsburgh Screw and Bolt plus factors that can keep your plant humming on schedule. Our quality controlled fasteners meet every standard of performance—but most important, we offer service. Personalized attention to cut red tape. Consequently, back-up stocks of standards are immediately available to strengthen our distributor's supply. Keep us in mind for filling complete orders—fast!

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## BAND SAW
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### *For FASTER Cut-off Sawing at LOWER COST!*

The all-new MILFORD MILBAND is the *first* band saw machine specifically designed, developed and constructed from the bottom up to give you the extra ruggedness, rigidity, variable speed range and other characteristics needed to handle high speed steel band saw blades with maximum efficiency. Built to withstand the heavy feeds and fast blade speeds of which high speed steel blades are capable, the MILBAND Machine takes continuous, heavy duty sawing in its stride without requiring frequent or costly maintenance. Here, in fact, is the machine you need to produce more . . . save more!

### *MILBAND gives you lowest cost-per-cut . . .*

because you get more pieces per man-machine hour. Fully automatic bar feed permits a completely automatic stock feeding cycle. Narrower kerf with at least 50% less chip loss means big savings in material.

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than other cut-off methods. This means less allowance for waste, less subsequent machining time to remove surplus metal.

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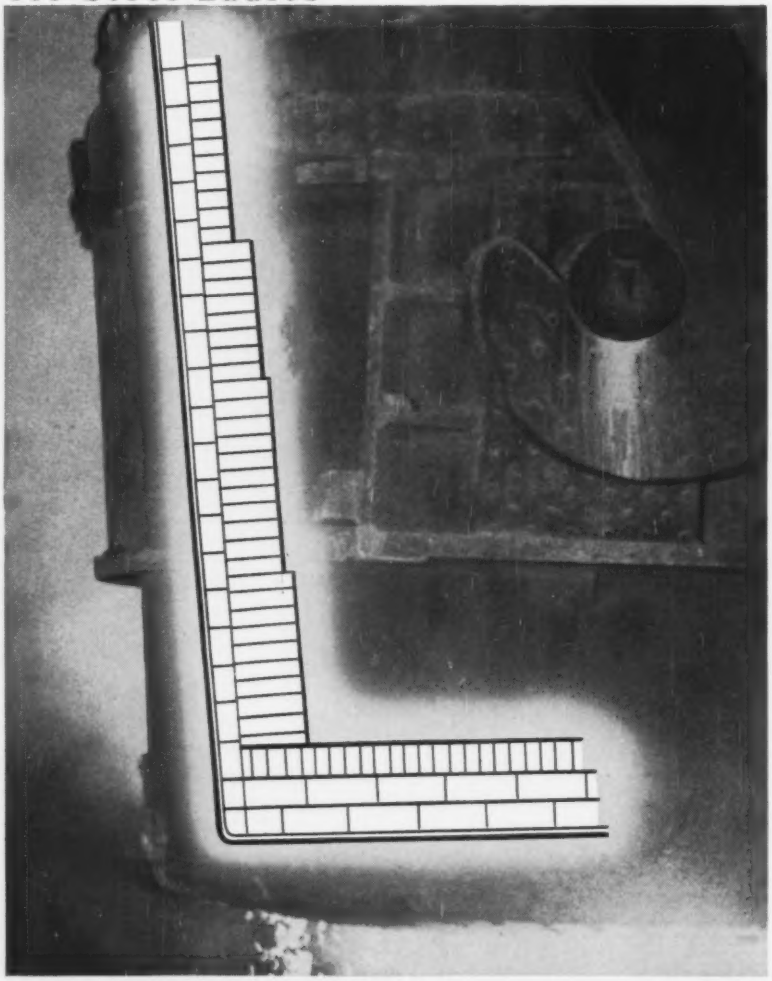
for Steel Ladles






**over 8,000 tons of steel before relining**

That's the kind of record DANDO Chord Brick are making. And this tonnage is matched by an economical first cost. These same price and performance factors will give *you* a lower ladle cost per ton of steel.

Why not investigate DANDO Chord Brick Linings for your ladles? Write *McLain Works, Refractories Division, H. K. Porter Company, Inc., Porter Building, Pittsburgh 19, Pa.*

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H.K. PORTER COMPANY, INC.

DIVISIONS: Connors Steel, Delta-Star Electric, Disston, Forge & Fittings, Leschen Wire Rope, Mouldings, National Electric, Refractories, Riverside-Alloy Metal, Thermoid, Vulcan-Kidd Steel, H. K. Porter Company (Canada) Ltd.


(Continued from P. 85)

Rockwell Mfg. Co.'s Meter and Valve Division, and **J. R. Applegate,** named branch manager of the Division's Detroit sales office.

**J. A. Houston,** appointed general manager, Dallas, Tex., plant, Joseph T. Ryerson & Son, Inc.

**G. E. Austin,** appointed district manager for Link-Belt Co. at Spokane, Wash.

---

**Irvin Zimet,** appointed executive assistant to the president, The Victoreen Instrument Co., Cleveland.

**W. J. Lawler,** appointed product sales manager, rod, bar and wire products, Kaiser Aluminum & Chemical Sales, Inc.

**B. W. Didsbury,** appointed assistant general manager, Buffalo, N. Y., plant, Farrel-Birmingham Co., Inc., Ansonia, Conn.

**W. L. Ruth,** appointed abrasive engineer, Sterling Grinding Wheel Co., Tiffin, O.

# MINIMUM MAINTENANCE, LONG LIFE ASSURED BY THESE HEAVY-DUTY "BUFFALO" FANS

"Buffalo" Type "BLH" Fan
For Classes III & IV Service

"Buffalo" Type "BL" Fan
For Classes I & II Service

The high performance characteristics of these two outstanding "Buffalo" Fans has resulted in their widespread use in the field of industrial air handling. In addition to offering peak-efficiency operation in their respective classes, both the "BL" and the "BLH" bring you a bonus economy factor of *maintenance reduced to an absolute minimum* throughout a long, productive life. This minimum maintenance factor is directly due to unusually rugged "Buffalo" construction features such as:

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**SHAFTS** — Hot-rolled or forged shafts are ground to close tolerances for perfect wheel and bearing fit.

**WHEELS** — Sturdy backward-curved blades are welded to the die-formed shroud and welded or riveted to the solid backplate. Heavy hubs assure permanent shaft alignment. For higher tip speeds, reinforcing rings provide necessary wheel rigidity.

**BEARINGS** — Self-aligning anti-friction bearings are designed for continuous operation at maximum tip speed. Horizontally split, ring-oiled, self-aligning, babbitted sleeve bearings are also available.

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Minimum maintenance is assured by the famous "Q" Factor — the built-in QUALITY that provides trouble-free satisfaction and long life in every "Buffalo" product.

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*Canadian Blower & Forge Co., Ltd., Kitchener, Ont.*

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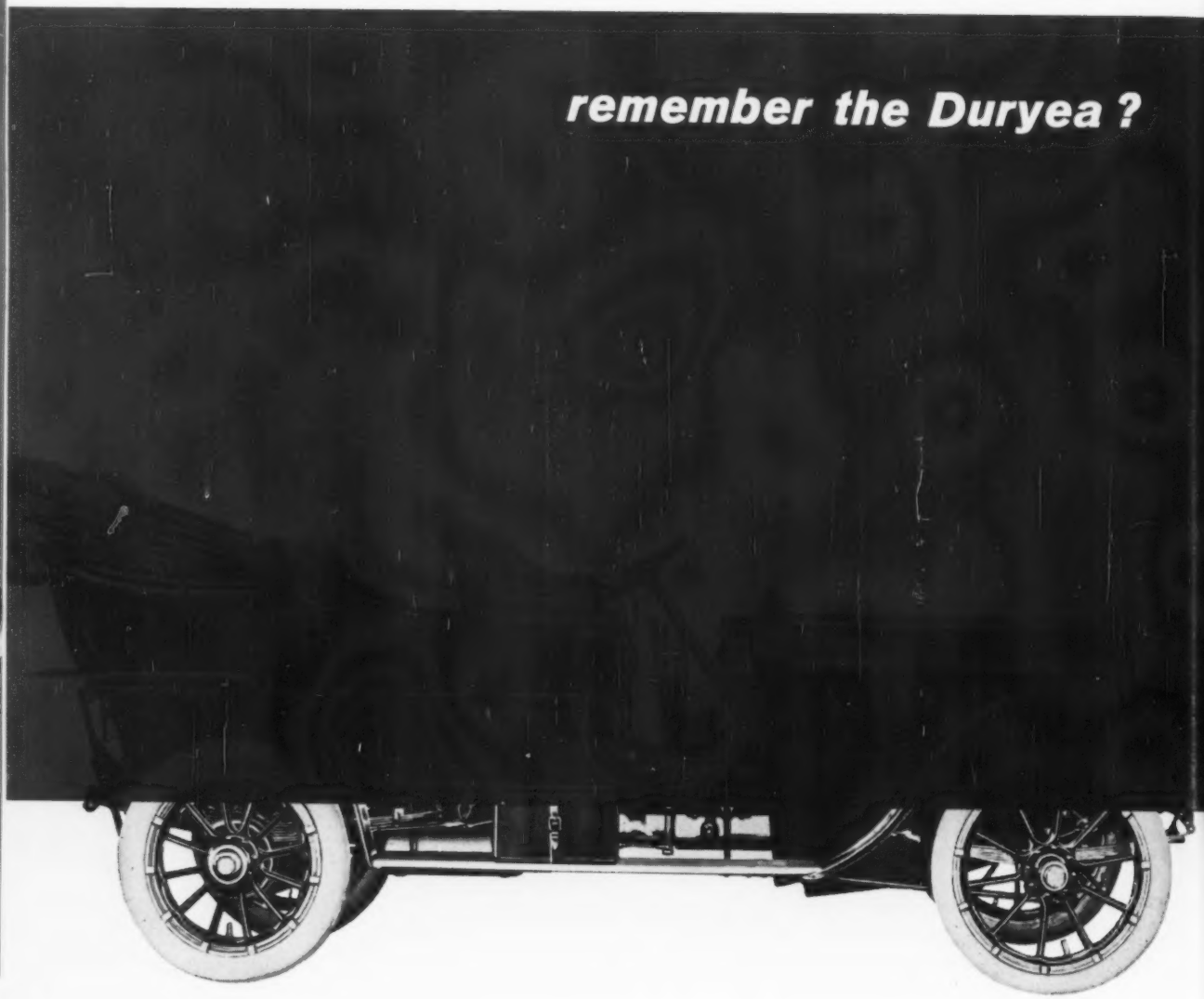
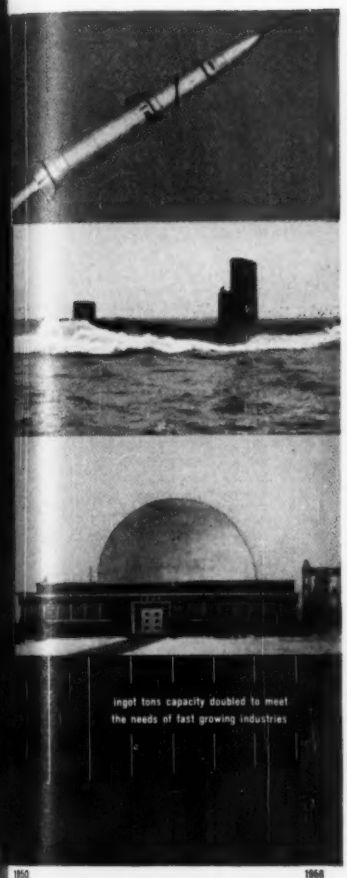
## *remember the Duryea ?*



It was quite the aristocrat of its day . . . along with the Pope-Hartford, Knox, Locomobile and the Lozier—all gone and nearly forgotten ghosts of a magnificent era.




The motor maker's problem then was not *how to sell* but *how to make.* And to put fresh confidence in the infant industry's first steps, *Carpenter* contributed wondrous new chemistries of steel . . . the first basic automotive alloys.

Since that day, startling discoveries in the *Carpenter* laboratories read like a history of American steelmaking. New steel formulations, quality controls . . . even new steel terminology originated by *Carpenter,* are now standards in steel mills throughout the country.

With this leadership in pioneering and production of the world's finest steels—goes the responsibility of meeting the constantly growing demands of the atomic age—more stainless, more tool steels, more special-purpose alloys. For a company whose history was based on quality rather than quantity, this was quite a challenge.

To meet it, *Carpenter* has ***doubled its ingot tonnage capacity within the past year, through the acquisition of steelmaking facilities in Bridgeport, Conn.*** New furnaces, mills and finishers—all completely equipped with precise *Carpenter* quality controls—began operation.

Capacity—mass production of specialty steels for critical applications—is an established fact.

In the years ahead, *Carpenter* will continue to lead the way and grow apace of industry's ever-increasing demands for the world's finest specialty steels.

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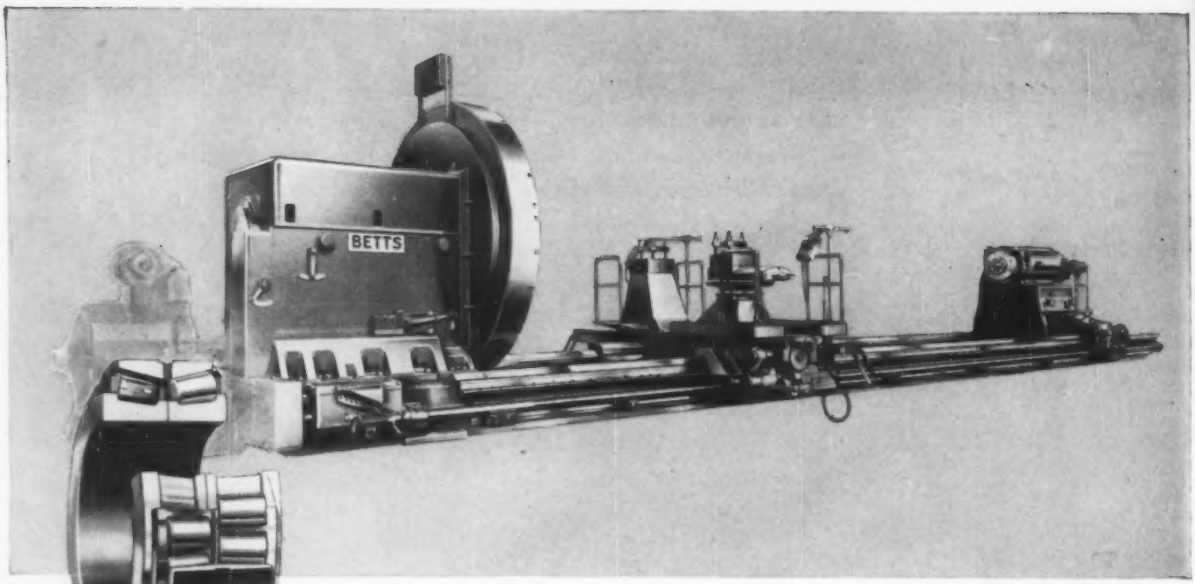
*Main Office and Mills, Reading, Pa.*
*Alloy Tube Division, Union, N. J.*
*Webb Wire Division, New Brunswick, N. J.*
*Carpenter Steel of New England, Inc., Bridgeport, Conn.*

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Whatever the requirement, large or small, special or standard, Torrington makes the right type of anti-friction bearing for your specific needs.

You can rely on the broad and diversified experience of Torrington in the design, manufacture and application of anti-friction bearings. Call on your Torrington representative for help in selecting the right anti-friction bearing for your product. **The Torrington Company, Torrington, Conn.—and South Bend 21, Ind.**

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# Are Metallic Meteorites a Key To the Re-Entry Problem?

By **R. E. Maringer and G. K. Manning,** Div of Metallurgical Engineering, Battelle Memorial Institute, Columbus, O.

**Even the fastest missile seems relatively sluggish when compared to the cruising speed of the average meteorite.**

**Metallic meteorites help to spell out the magnitude of high-velocity space travel—especially the re-entry problem. Here are some of the interesting facts they have to tell.**

■ Anyone who has ever caught sight of a meteor during its brief, incandescent existence can begin to appreciate the magnitude of the re-entry problem. These tiny bits of matter enter the atmosphere at such tremendous speeds (28,000 to 162,000 mph) that they are usually destroyed by the heat they generate.

Such heat generation, resulting from countless collisions of the meteor with atmospheric molecules, presents a "thermal barrier" to high-velocity atmospheric flight. Its effects are felt even in the relatively slow supersonic aircraft of today.

Still, the thermal barrier is not impenetrable. Occasionally, portions of one of the larger meteoric particles arrive intact at the earth's surface. These surviving fragments, or meteorites, contain many clues to the nature and severity of the re-entry problem.

**Metallurgy Helps**—Some of these clues, particularly in metallic meteorites, can be found and evaluated by using relatively simple metallographic techniques. To see how this is possible, it is necessary to keep in mind some of the details of structure in metallic meteorites and some of the grosser aspects of aerodynamic heating.

Many meteorites, classed as irons, are almost entirely metallic. They may contain from 5 to 40 pct nickel and a number of lesser impurities (chiefly phosphorus and sulphur) in addition to iron. When nickel content is between 6 and 10 pct, meteoritic iron has a characteristic Widmanstaetten structure.

**Phase Keys**—In a photomicrograph of the Grant meteorite (Fig. 1), the most prevalent phase is alpha iron, or kamacite. Kamacite is easily identified in most meteorites because of its long, narrow deformation twins, or Neumann lines. The alpha-iron grains, in this case containing about 7 pct Ni, are

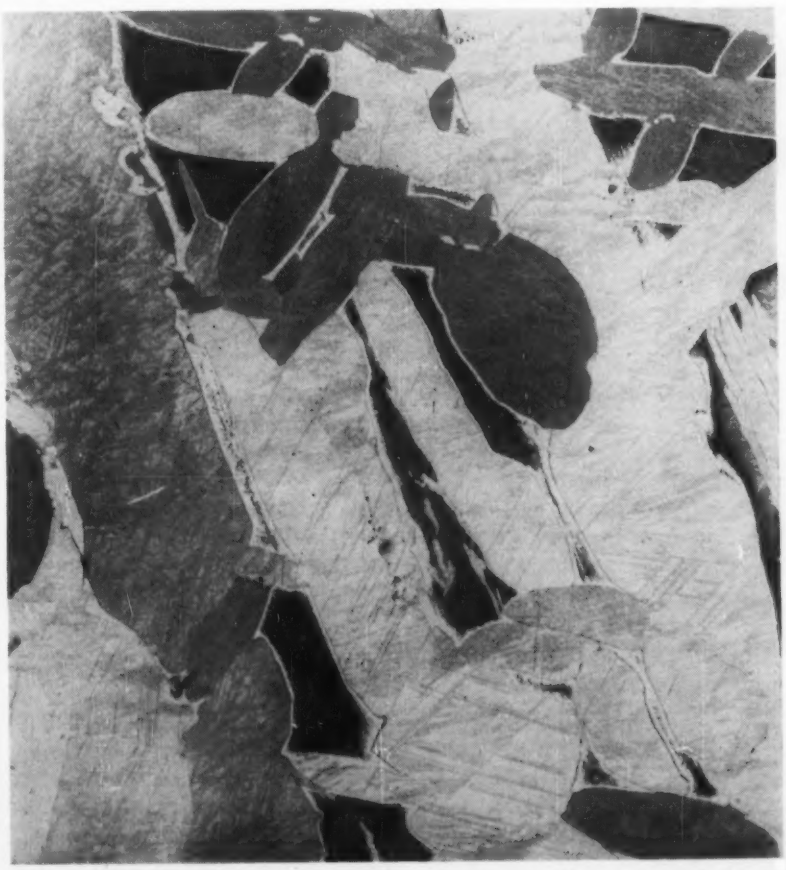


**FIG. 1:** The microstructure of the Grant meteorite shows a prevalence of alpha iron. These grains are surrounded by white bands of gamma iron.

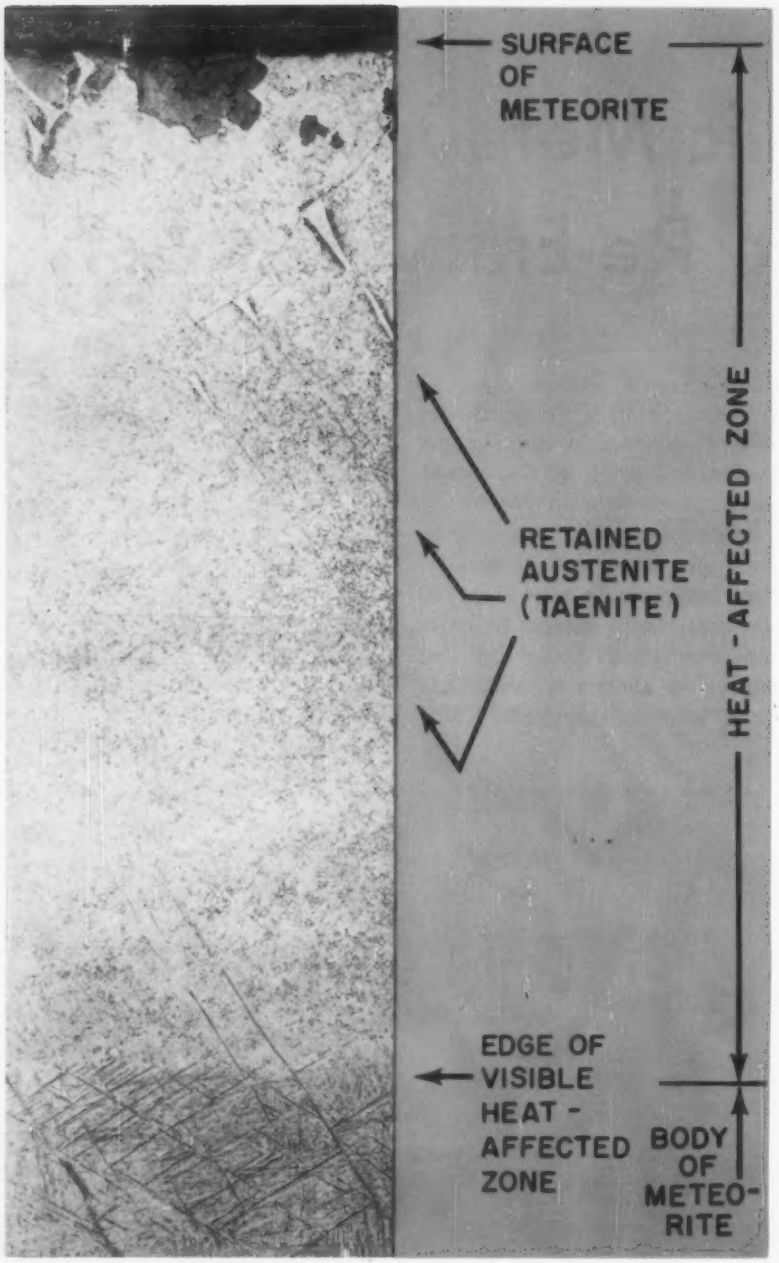

SURFACE OF METEORITE
RETAINED AUSTENITE (TAENITE)
HEAT - AFFECTED ZONE
EDGE OF VISIBLE HEAT - AFFECTED ZONE
BODY OF METEO-RITE

**FIG. 2:** Aerodynamic heating causes microstructural changes in metallic meteorites. Above are changes noted in Costilla Peak meteorite. Such changes can be simulated with laboratory heat treating equipment.

surrounded by white bands of gamma iron, or taenite. Nickel content in the taenite may reach 40 or 50 per cent, possibly more.

There is also a dark etching, acicular phase known as plessite. Most of it is alpha iron containing about 13 pct Ni. This phase is believed to have formed as a result of the sudden release of pressure at a late stage in the formation of the meteorite.

The structure as it exists tells us that the Grant meteorite—like most other irons—was once molten, and that it cooled very slowly. Hundreds of thousands, perhaps millions of years were required for the molten mass to cool below 300° or 400°C (572°-752°F). Phase separation and precipitation had a chance to proceed almost to equilibrium at relatively low temperatures.

**Under Stress**—The presence of deformation twins shows that the larger body from which the Grant came was subjected to a severe, probably cataclysmic shock wave. This introduced severe internal stresses.

Because of these conditions unique to meteoritic iron, any brief excursion of the mass to higher temperatures produces stress relief, particle dissolution, phase transformation, or recrystallization. These structural changes produce readily resolvable alterations both in visible metallographic appearance and in microhardness.

One such temperature excursion results from aerodynamic heating as the meteorite passes through the atmosphere at high velocity. While the exact character of aerodynamic heating is not understood, certain processes are known to occur. For example, we know that the surface of the meteorite heats rapidly. When the melting point is reached, the molten metal is swept away by the surrounding air flow.

**Metal Flows** — Flight markings that appear on many meteorites confirm this. Further confirmation stems from the frequent appearance of a lamellar deposit (Fig. 3) on more or less protected areas. Such a deposit probably formed when molten metal from the frontal surface was swept along by the air flow and froze where the conditions of aerodynamic heating were not so severe.

While it is reasonably certain that the process of surface erosion, or ablation, involves the mechanism described above, this may not be the sole mechanism operating. Direct vaporization of the surface may contribute to material losses.

The melting mechanism is believed to predominate—at least in the final seconds of flight. Assuming this, and that the rate of ablation remains reasonably constant

during the final seconds of flight, sets the stage for the evaluation of the structural changes brought about by aerodynamic heating.

**Check Thermal Gradient**—During flight, heat is transferred through the liquid-solid interface into the interior of the meteorite. For a constant rate of ablation, a steady-state relation will ensue. A fixed thermal gradient will be set up.

The mathematics describing this situation is available. It is possible to calculate (or estimate) rates of heat flow and rates of ablation associated with any given thermal gradient. The problem then resolves itself into one of reconstructing the thermal gradient. Here is where metallurgy and metallography play their role.

When viewed on a section cut perpendicular to the meteorite surface, a distinctly visible "zone of alteration" is often seen just below the original surface. An example of this zone (on the Costilla Peak meteorite) is shown in Fig. 2.

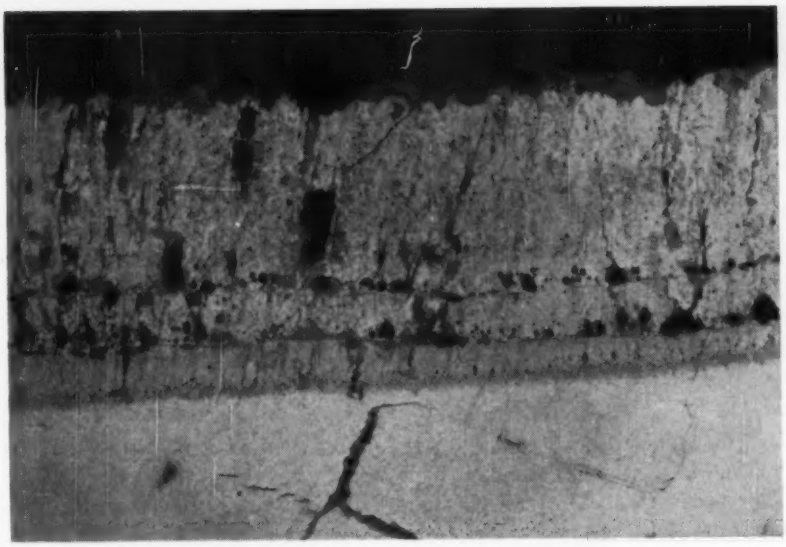
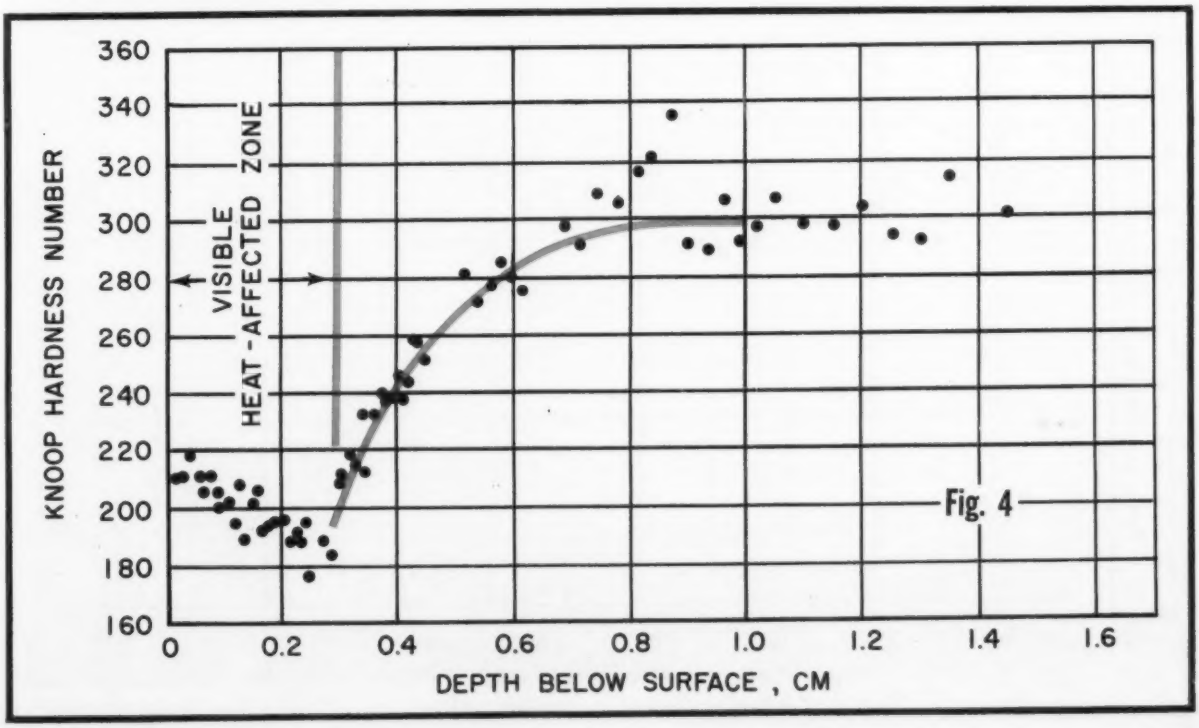


**FIG. 3:** A lamellar deposit appears on the trailing edge of the Costilla Peak meteorite. Metal froze where aerodynamic heating was milder.

There is a change in structure near the bottom of the photograph, dividing recrystallized from (visibly) unaltered material. This suggests that the initiation of recrystallization can define at least one point on the temperature gradient.

**Hardness Changes**—Interestingly enough, while structural alterations cannot be seen in the microstructure below the edge of the visible heat-affected zone, there is a significant variation in microhardness in this region. An example of such a

## Hardness Data on Leading Edge of Meteorite



hardness gradient is plotted in graph on p. 95.

These variations in structure and hardness were produced by the thermal gradient which existed during the flight of the meteorite. To associate these variations with actual temperatures and thereby reconstruct the thermal gradients, it was necessary to heat treat and examine actual meteorite specimens.

**Lab Approach**—This was done in the following way. Small specimens were cut from the interior of the Grant and Costilla Peak meteorites where the material had not been affected by aerodynamic heating. Each of these specimens was dipped into molten salt at a given temperature, held for a short time (usually 20 seconds), then removed from the salt and air cooled.

This duplicated reasonably well the rate of heating and cooling to which the material near the meteorite surface had been exposed during flight. The time at temperature (while it has its effects) has been shown to be a minor variable for the short times involved here.

Each of the specimens was then examined metallographically to estimate the extent of structural alteration. For both meteorites, the temperature represented by the edge of the visible heat-affected zone is about 770 ± 20°C (1418 ± 36°F). Knoop microhardness indentations were made in the alpha-iron phase of each of these samples. The effects of such heat treatment on the hardness of the Costilla Peak meteorite are shown in graph below.

**Severe Ablation** — Comparing these data to actual structural and hardness data near the heat-affected zone of the meteorite permits the reconstruction of the thermal gradient. Calculations based on these data and on certain physical properties such as specific heat and thermal conductivity indicate that the rates of ablation encountered by these two meteorites were of the order of 1 to 2 mm per second.

If this rate of ablation persisted for 20 to 30 seconds, the mass of the Grant meteorite found (about ½ ton) represents only from ½ to ¾ of the mass which existed prior to its entry into our atmosphere.

From the standpoint of aerodynamic design, irregularly shaped, iron-nickel meteorites leave a lot to be desired. Far more appropriate materials could be chosen for high velocity re-entry. But meteorites still contribute by underlining the severity of the problem with which our designers are faced.

**ACKNOWLEDGMENT:** This research was supported in whole or in part by the U. S. Air Force, monitored by the Aeronautical Research Laboratory, Wright Air Development Center. Meteorite specimens were made available by Mr. E. P. Henderson of the Smithsonian Institution and Dr. B. Mason of the American Museum of Natural History.

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## How Heating Affects Meteorite's Hardness

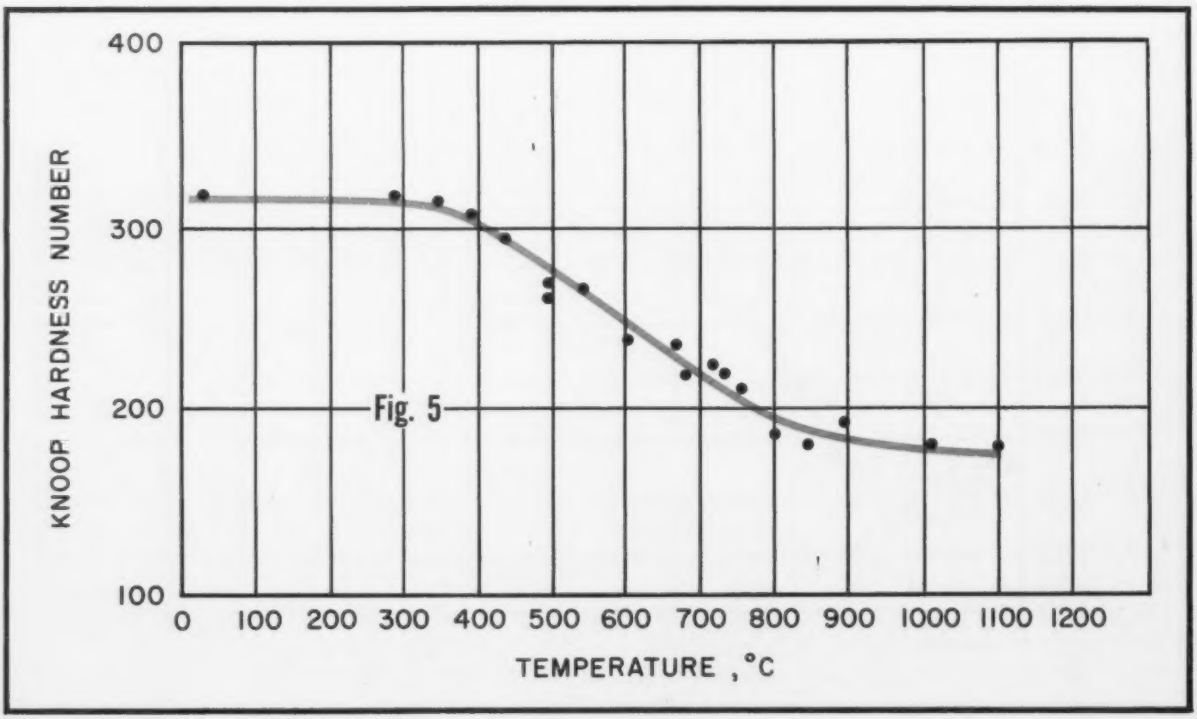



Fig. 5

# Big Barrel Cleans Castings Fast

**Can you clean workpieces faster and better for less money? With less labor? A large jobbing foundry thinks so. And does.**

▪ Big savings in time and money result from a large jobbing foundry's use of a giant new cleaning barrel. The high-capacity unit cuts time for cleaning castings by one half.

Not only this; the 72-cu-ft capacity blast barrel also simplifies material handling while boosting labor efficiency.

In use at Fort Pitt Steel Casting Div., Pittsburgh Steel Foundry Corp., McKeesport, Pa., the unit cleans loads of more than 5000 lb each. Turning out some 600 tons of steel castings a month, the division formerly used two airblast rooms for larger castings. Two 20-cu-ft barrels handled smaller work.

**Blasts Nearly All**—Now the new barrel does nearly all blast cleaning jobs for the foundry. It has put one of the airblast rooms into retirement, plus one small blast barrel. The other airblast room still touches-up the very largest castings.

The second barrel is on emergency standby duty. So far its use hasn't been necessary, however.

A single casting formerly required five minutes for a simple spot blast. But now, it takes just eight minutes to thoroughly clean four. This spells out a time slash from 20 to eight minutes for the four castings, five to two minutes for each individual piece.

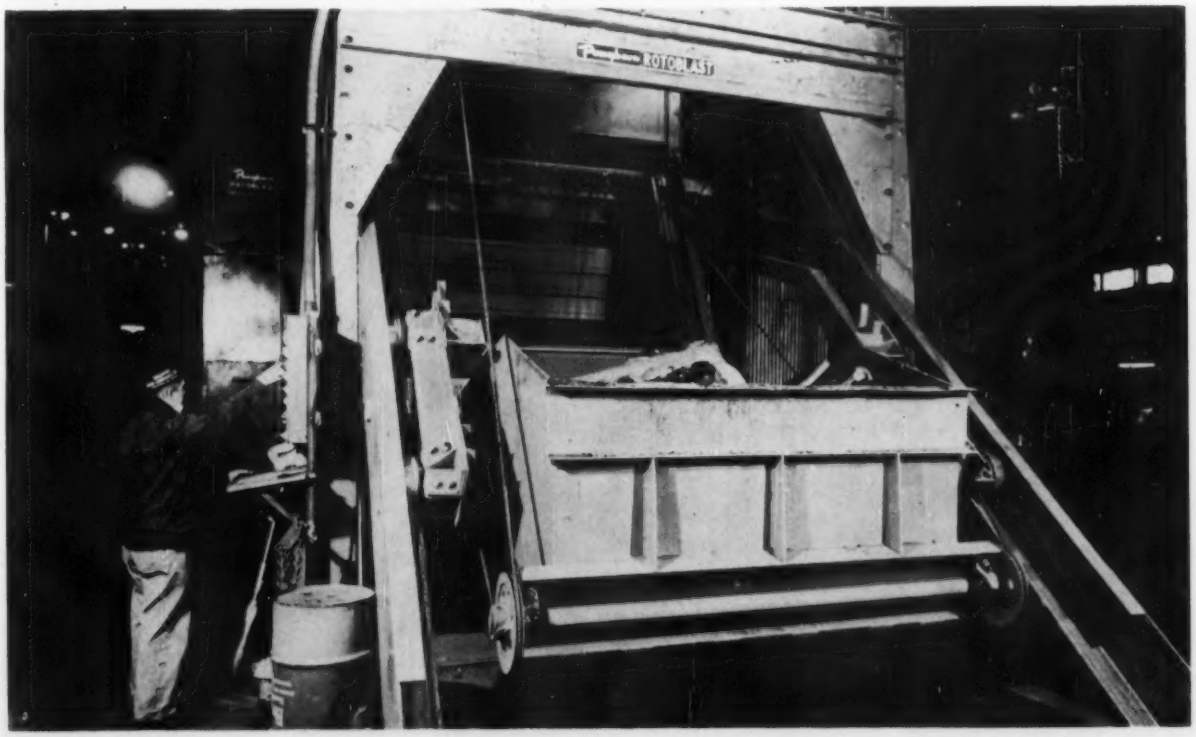
**Labor Benefits** — Such speedy output delivers labor advantages too. It lets the company use five men once on the cleaning crew, for other plant jobs.

Quality is important also. Before, castings were cleaned in the green stage only by spot blasting at points where gates and risers were to be cut off later. Most castings now get cleaned three times: (1) in the green stage prior to burning off gates and risers; (2) after heat treatment; (3) after welding and drawing.

With sand cores gone, subsequent operations take less time. Moreover, better annealing results.

**Speeds Handling** — Additional savings register via better materials handling techniques. A fork truck with a tote box now can handle large castings where it was once necessary — in airblast rooms — to individually load, turn and unload workpieces.

The barrel, a product of Pangborn Corp., Hagerstown, Md., makes the operator's job easier. A push-button controlled unit loads castings into the machine. All operations work automatically from a convenient panel.



**UP THEY GO:** The operator pushes a button and load of castings moves toward the 72-cu-ft work chamber.

# New Line Speeds Structurals

## Conveyors Link Units for Continuous Processing

**Designed just to get around the difficult handling of huge beams, this line offers flexible production in structural steel fabricating.**

▪ An advanced way to process structural steel is now in operation. The all-in-one setup cuts, drills and cleans structural sections in one continuous line without conventional in-between handling of materials.

Installed in the recently completed shop at the Toronto plant of Dominion Bridge Co., Ltd., the unit occupies 330 x 60 ft of floor space. The new equipment prepares steelwork to higher standards of quality at lower cost.

**Key in Handling**—In the preparation aisle, four machines are linked together by motorized conveyors and transfer skids. The setup saws steel beams in one quick slice, drills holes up to 1¼-in. diam in flanges and webs, both horizontally and vertically. A blast cleaner treats surfaces with steel shot at 2500 lb per minute.

The setup handles I-beams, angles or column sections up to 70 ft long, 30 in. wide or 16 in. high, with webs in a horizontal position. Conveyor speeds are up to 20 fpm.

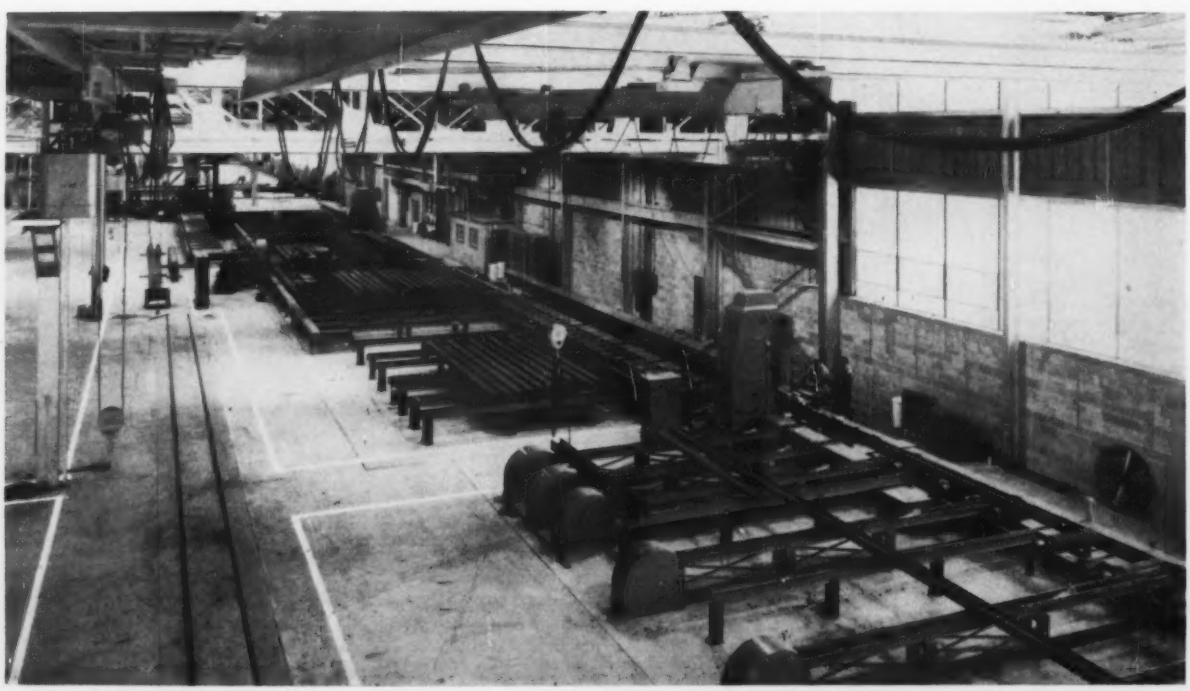
First in line is the cold saw with a 44- or 48-in. diam rotary cutting blade. Supplied by Clifton and Baird Co., Scotland, it is fitted with controls for guiding and clamping the beams in position for cutting to length.

**Versatile Drilling**—After cutting, the beam moves to a horizontal drilling machine. With two six-spindle drilling heads, the unit drills both flanges at once.

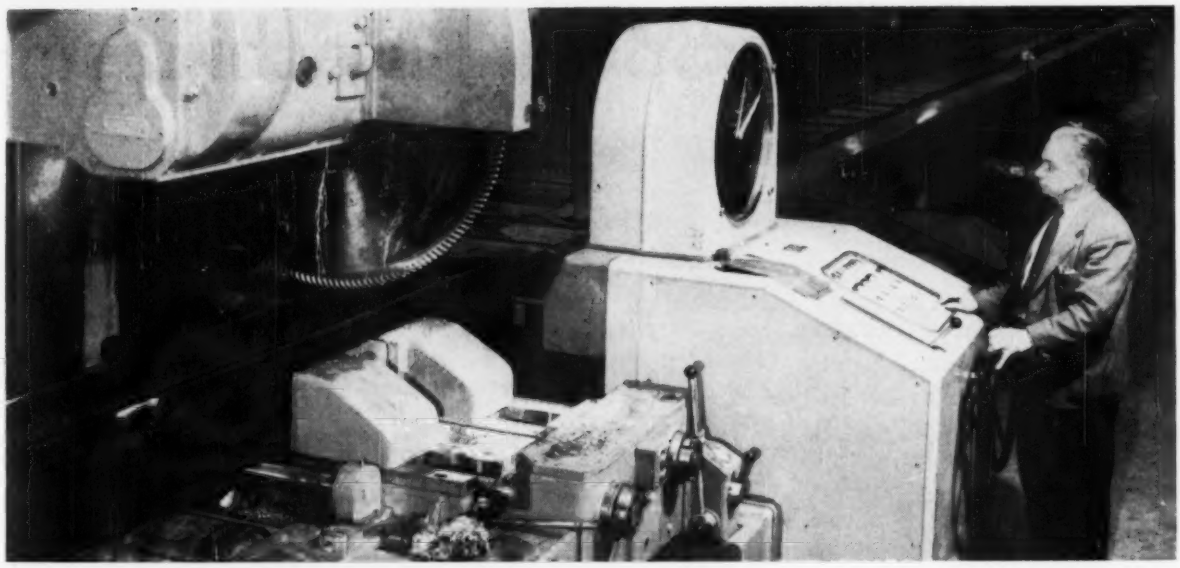
For drilling web holes, an adjacent vertical drilling machine with one six-spindle head does the job. The beam reaches it via motorized transfer skids. Both drilling units were built by Archdale Co., Ltd., Worcester, England.

At the end of the line, the beam passes through the blast cleaner for removal of rust and mill scale. This unit, made by Wheelabrator Corp., Mishawaka, Ind., also cleans plate from the platework section of the plant—60 in. wide in a single pass, or 96 in. wide in a double pass.

For cutting to length or spacing of holes, each cutting and drilling machine is synchronized with the conveyor rollers. The operator watches a clock-like dial, calibrated



**PROCESS IN-LINE:** From the rotary saw (right) to the blast cleaner (left rear), roller conveyors speed parts.



**FAST CUTOFF:** After first cut, beam travels at 60 fpm with length shown on dial. Handwheel sets length.

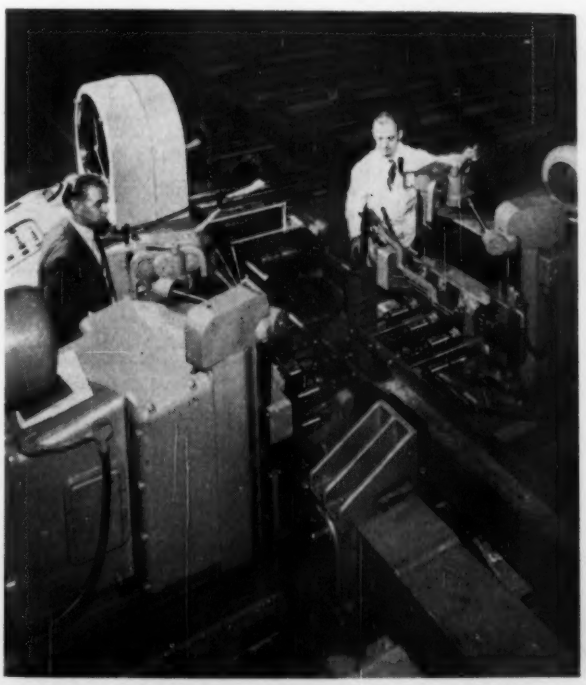
in feet and inches, mounted behind each control station.

**Insures Accuracy**—As soon as the required distance shows on the dial, the operator stops the part. It's easy to hold accuracy within 1/16 in.

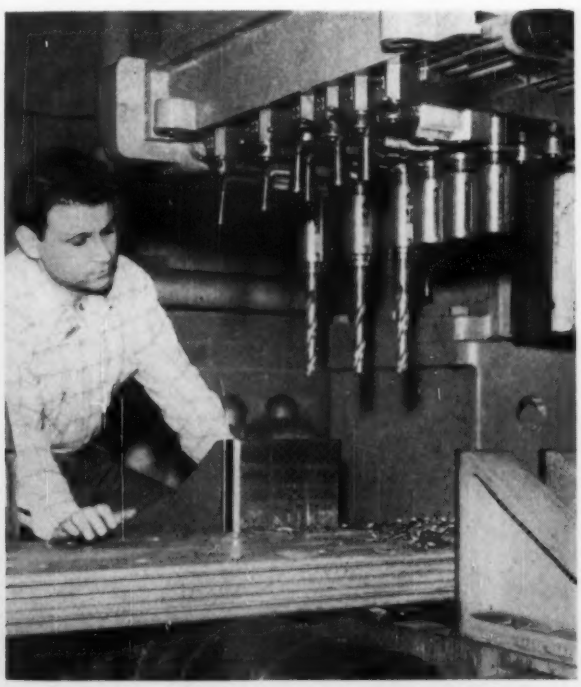
Layout of machines and conveyors is so arranged that any operation may be by-passed if not required. After cutting a beam, the saw operator can send it to either drilling unit, direct to the blast cleaner, or to any one of the intermediate storage skids. Or he can speed it to other skids for return to the yard.

Safety is an important feature. Any one of the operators at the individual machines can stop the operation of the entire unit at the touch of a button.

Boulton & Paul, Ltd., Norwich, England, originated the layout and design of the unit, in cooperation with Dominion Bridge Co. engineers.



**DOUBLE HEADS:** Horizontal drill takes advantage of double heads to drill both flanges of beam at once.



**VERTICAL DRILLING:** Six spindles arranged in line drill holes at any position across the width of the web.

# How to Buy Special Machines

## Pool Your Best Ideas With Those of a Reliable Builder

By Leo Gajda—Vice President and Director of Engineering, Snyder Corp., Detroit

**There are right and wrong ways to buy special purpose machines. Here are valuable pointers offered by the executive engineer of a leading builder of special machine tools.**

▪ When you first begin to cast an eye around for special equipment, chances are you have a very specific need. You may need it to produce a new part, or to boost production of one you're now making.

There may be other reasons too: a change in design, a desire to improve quality, a drive to cut production costs or to eliminate safety hazards.

**What To Expect**—Development and engineering on special equipment costs money, big money. These days it's too much to expect suppliers to invest engineering time and cash on an extensive design and quotation with no assurance of getting an order.

If you're considering a simplified special machine or a transfer machine to produce one part, engineering a proposal may take one to four weeks. If the machine must process a variety of parts, the job may take one to two months.

Unless you've had extensive dealings with equipment builders, the most you can expect—until you make a commitment — are rough proposals based largely on the suppliers' past experience. Any cost estimates must necessarily include some cushioning for the unexpected.

**The Best Way**—The best solution, especially for new purchasers, may be to seek a supplier with known ability to engineer the type of equipment needed. Then the two organizations can set up a cooperative engineering program on a cost-sharing basis.

This involves many people from each company. In the manufacturer's unit are the factory manager, master mechanic, process engineer, controls engineer, plant (layout) engineer and maintenance engineer. On the vendor's unit are sales engineers, estimators, machine designers, factory supervisors and service engineers.

The combination is something like a pro football team with defensive and offensive specialists, working together under co-captains. Individual convictions must be subordinated. Successful strategy is to collect all ideas from the group, arrange them in the best manner and transpose them into practical reality.

**Three Step Program**—There are three phases in this program. They are: (1) recognition of the problem; (2) definition of the problem; (3) working out a good solution.

Sometimes a manufacturer thinks he has one problem when actually he has another—or several. The vendor can save him money in the long run by helping clarify the situation. That's why the second phase is important.

To completely define the problem the first thing is to study the part itself. For this the vendor's group needs a valid part print—one that

**SAVES TIME:** Sample part on drafting table helps machine design group in developing special equipment. (Author Leo Gajda is at left).

won't change too much before the equipment is finished. A part blank or a finished prototype is also a big help to the machine builder even in design stages.

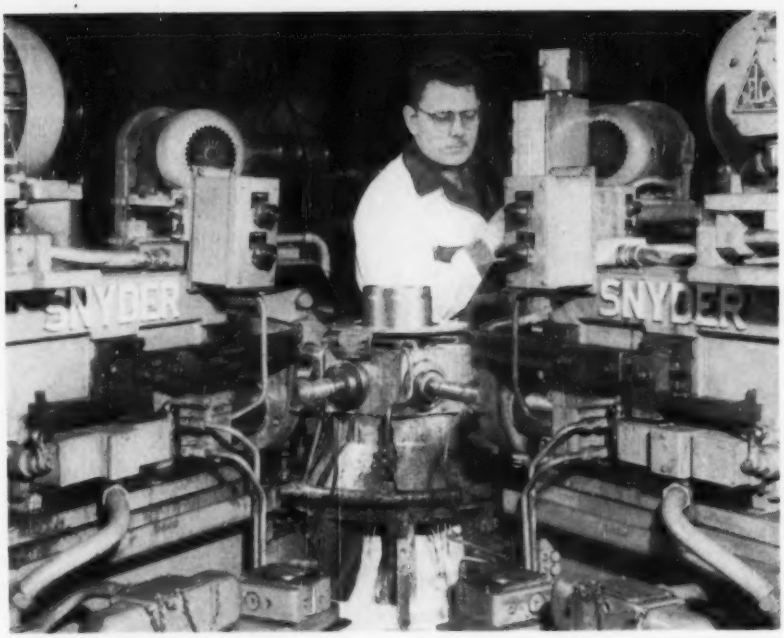
**Study the Part**—Questions to be considered are: How should the part be processed? What are the production quantities? Are these realistic or exaggerated? Is automation called for?

If the part is to be made on transfer-type equipment, the builder should number all holes to be machined. This assures everyone of definite reference points for discussing the part and the operation needed to make it.

Types of operation must also be defined at this time. Again, if the part is to be made on a transfer machine, the rough piece should be studied with regard to locating surfaces. It may be necessary to add clamping or locating lugs so the part can be transferred properly from station to station.

Another important consideration is the degree of machining to be done. Holes or surfaces that need only be roughed or semifinished should be indicated so that unnecessary accuracy will not run up the cost of the machine.

**Other Requirements** — It's important, too, for product designers to use common sense in setting part tolerances. Unnecessarily close ones can waste time and money.



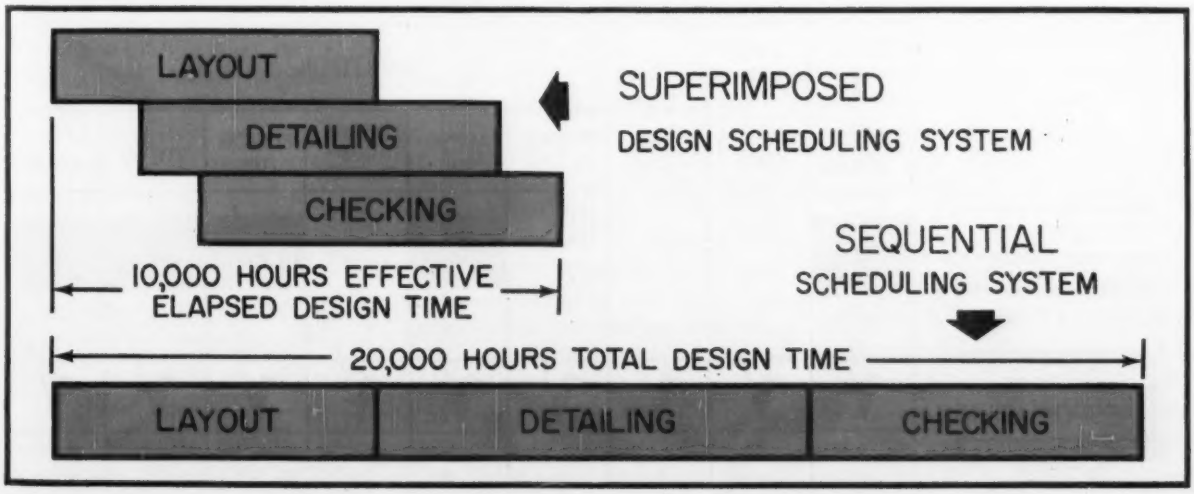

**IN PRODUCTION:** Special rotary-index machine at General Motors' Detroit Diesel Div. mills oval shaped port holes in sleeve liners.

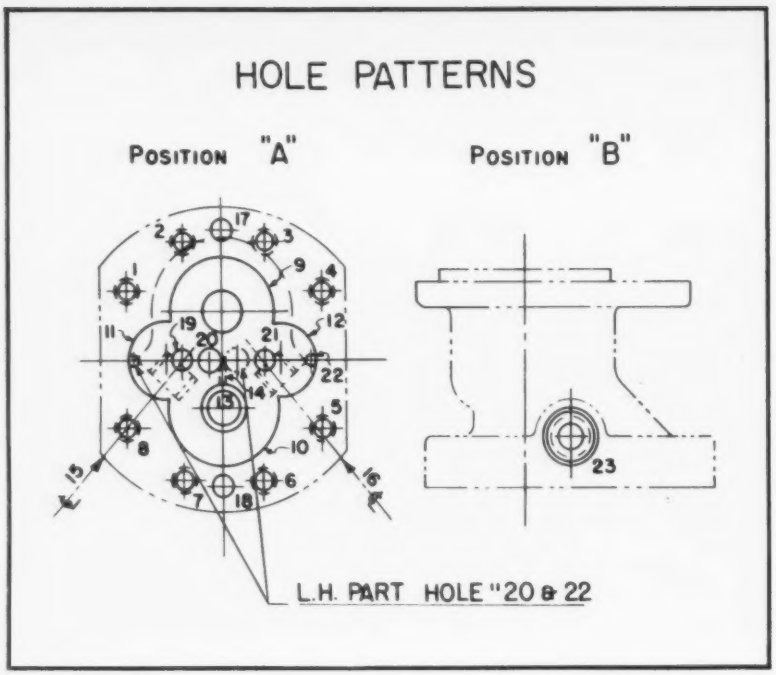
Similarly, the manufacturing organization should be sensible about the production rate. This factor usually establishes the type of machine recommended. Exaggerated production requirements—added in the guise of a safety factor—lead to confusion and excessive machine cost. This can ruin harmonious teamwork between the two organizations.

Another danger point is the delivery date. Constant changes can strain relationships. A reasonable date should be set by consultation, then held to.

Floor space for the new installation must also be set before final specifications are defined. The buyer organization can tie the builder's hands by allocating whatever odd space happens to be available. Efficient layout in modern

## Overlapping Phases Cut Design Time






**NO MISTAKES:** Numbering holes on the workpiece—and on corresponding special-machine drawings—saves time and averts possible errors.

plants calls for adequate space for good maintenance and accessibility.

**Planning Solves Problems**—The final phase of the program depends for its success on the previous two. If planning has been adequate, the supplier has a good start on solving the production problems.

As machine design progresses, coordination becomes increasingly important. Considerable savings in lead time are possible by superimposing design, detailing and checking operations. The magnitude of the task is obvious: a typical transfer machine takes up to 20,000 hours of engineering.

If the buyer organization insists on making extensive changes during this period, the effects are quite detrimental. Machine designers can't do their best when forced to make constant changes. One effective approach we have used is to declare a moratorium on changes during the critical period. Only when the general design is done do we make needed changes.

**Approval Stage**—As the general design nears completion, the next step is getting approval. This is easiest when both buyer and supplier groups have blended their ideas. But it's most important at this stage that personalities be subdued. Regular reports of progress help, too.

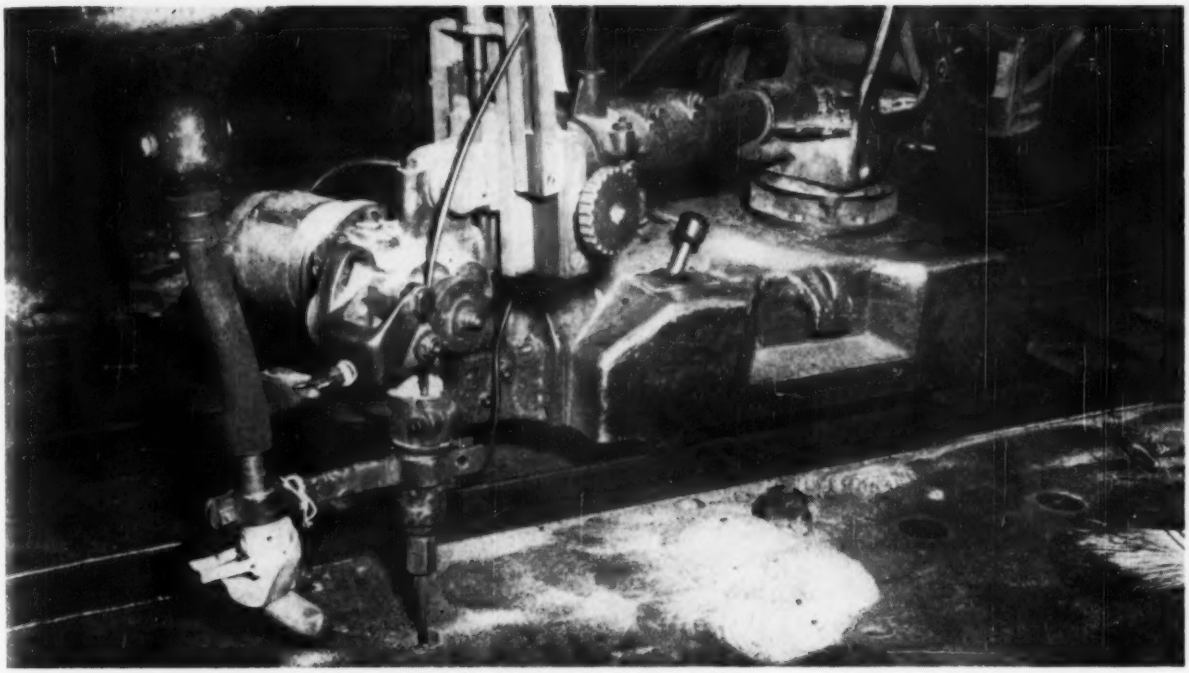
After approvals are in, the work moves rapidly into the shop. The builder releases drawings to his purchasing and manufacturing departments. Responsibility for cutting tools is settled, so they can be ordered and ready for the machine tryout.

The final, and most interesting step, is the tryout. Usually this begins in the supplier's plant on blanks furnished by the buyer. The buyer group should have an inspection team on hand.

Often the tryout and part inspection period continues after the equipment is installed in place. Errors in alignment may add problems, and there usually are other bugs to be worked out. Also the manufacturer's people must learn to operate and maintain the equipment. The supplier's service engineers can help on all these details.

## Three-Way Approach to the Problem

| | STEP 1 | STEP 2 | STEP 3 SOLUTION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | RECOGNITION | DEFINITION | PROPOSAL | GENERAL DESIGN | APPROVAL | DESIGN COMPLETION | FOLLOW UP | TRYOUT | INSTALLATION |
| BUYER RESPONSIBILITY | √ | | | | √ | | √ | √ | √ |
| SUPPLIER RESPONSIBILITY | √ | √ | √ | √ | √ | √ | √ | √ | √ |



**PLUGS HOLES QUICKLY:** Riding its own tracks, this welding machine fills holes in steel plates in only 17 seconds.

# Plug Welds Cut Costs, Effort

**Refitting ship plates can give joiners a rough time. But high-speed welding makes things easier—and cuts costs besides.**

▪ Savings in time, effort and materials result from a ship yard's use of welding for repairing freighter tank tops. And it makes good, strong joints.

Using in-place welding instead of riveting, Port Arthur Shipbuilding Co., Port Arthur, Ont., recently refitted two big ships with new tank top plates. Cuts in repair costs were considerable.

Refitting involved plug and seam welding of the plates to supporting angles in the holds of both vessels. Joining was by the rapid Unionmelt submerged-arc process, a product of Linde Co., division of Union Carbide Corp.

**How They Do It** — The shipbuilder first prepares the mild steel plates by beveling all edges to a 45° angle. Plates are 30-ft long, 7-ft wide, ⅞-in. thick. Fitting them in place, workers manually tack-weld the plates; then high-speed welding takes over. This seam-welds them around the edges and then plug-welds in three equally spaced courses.

Seam welds take three passes at a 12-ipm speed. For proper back-up for the automatic welding, operators manually weld-fill gaps between intersecting support angles.

**Fills Gaps Fast**—To make plug welds, operators position the Unionmelt machine over a hole and heap welding composition around the welding wire, filling the hole. Once the machine starts, it feeds a measured length of welding wire into the weld puddle. In some 17 seconds, it finishes the job.

On each ship, the company used four of these machines. Only 15,000 lbs of welding wire was necessary to do the jobs. This, the shipbuilder points out, is a great deal less "new" metal than riveting would have taken.

**Uses Less Metal**—At most, only 30 pct of the actual metal in the welds comes from wire addition. The balance consists of base metal melted to form the weld. With riveting, on the other hand, 100 pct of the joint is naturally "new" metal.

Not only this, seam welding eliminates need for overlapping plates in order to rivet them together. This means that welding reduces the amount of necessary metal even further.

Other savings result from welding's elimination of: (1) the cost of punching holes in the supporting angles; (2) the difficult task an operator would have in moving around in the confined space between the tank top and bottom plates of the vessel in order to "head" the rivets.

# Numerical Control Takes on Transfer Machining

**Does numerical control look too complicated for your shop?**

**Then look how a combination of numerical control and automatic transfer can do a boring and drilling sequence in record time on mixed parts.**

▪ While numerical control handles small lots of complex jobs superbly, how can you make this complicated and costly equipment do enough to pay its way?

A new machine developed by National Automatic Tool Co., Richmond, Ind., holds an answer. Installed at Detroit Diesel Div., GM, the unit ties numerical control in with transfer-style automation.

The GM plant's superintendent of process engineering, Robert H. Terry, likes to analyze numerical control in a practical way: "I think the tape machine is definitely in the production picture," he asserts. Further, he forecasts that we'll see many more tape-control machines on this kind of job, rather than on the more elaborate setups.

**FAST COMBINATION:** Tape-controlled transfer machine shifts flywheel housing to second station. Only loading is manual; tape does the rest.

**A Routine Job**—The part is a cast flywheel housing that's required on every model. The operation consists of rough and finish boring the starter hole, spot drilling three starter mounting holes, then drilling the three holes, and finally tapping them.

In the aircraft field, numerical control can be justified by the unusual nature of the workpieces. Here, the significant feature is the routineness of the job.

This flywheel housing comes in eight different cast iron variations and four aluminum castings. Actual processing for the starter mount is the same. Differences are in position. Also the hole axis may rotate through a considerable difference in arc.

**Fast Change-Over**—Job lots run from 50 to 500. With numerical control of production, change-over is a matter of a few minutes. While the radial positioning of the three heads could have been setup on tape, it was not justified economically and is thus done manually.

Cutting tools are usually changed only for a switch to aluminum. Once the operator loads the part, he presses the cycle button and the tape takes over.

It orders transfer and tells the machine when the part is set in each of the three machining sta-

tions. Also it controls timing of the head. It orders further transfer of the workpiece to the next station, and return to unload station when finished.

**Unit Keeps Pace** — With the number of different basic designs, engineers estimate that there are some 150 possible variations in mounting pad locations. Despite this, the new machine will give virtually continuous production, with relatively minor downtime for tape changes.

Accuracies are ±0.005 in. with relation to crank bore axis. But repeatability of this machine is much closer, more like ±0.0015 in.

Estimated machine cycle time (after loading) is estimated at about 208 seconds. This is based on feeding the 1⅞ in. boring stroke at 4 ipm; the 15/16 in. drill spindle stroke at 1 ipm; and tapping 40 turns at 25 ipm.

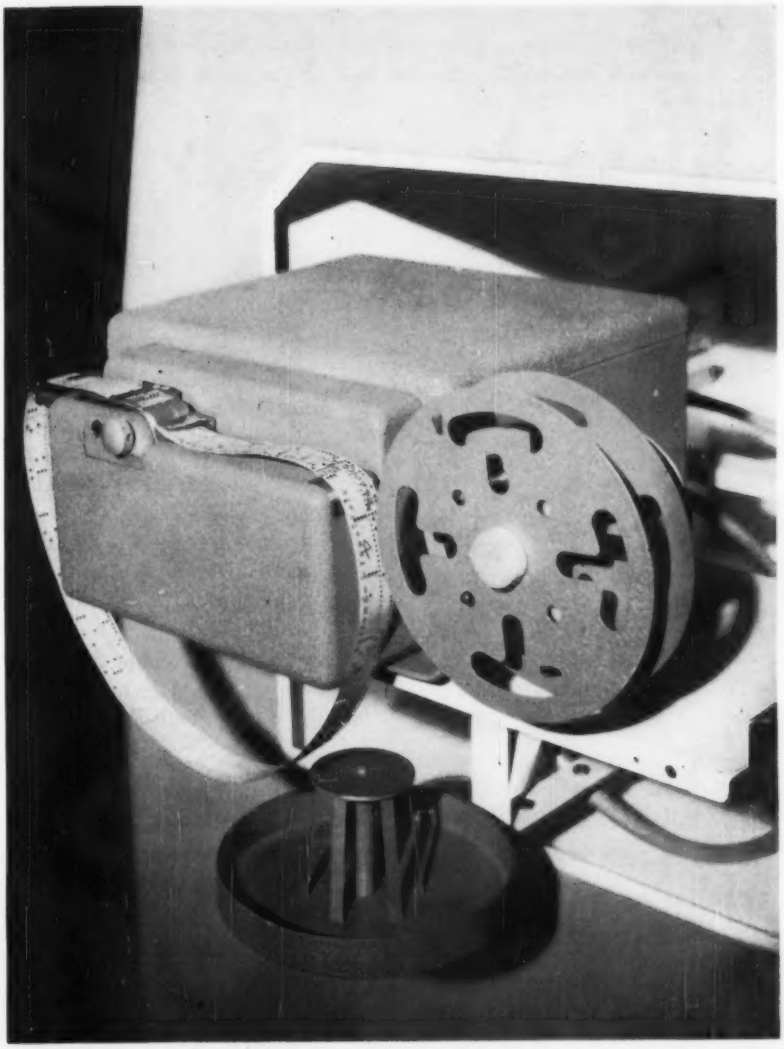
**Simple Work Holding**—There's just one fixture for work holding. It locates the part by the position of the mounting boss.

To tool a conventional machine or machines to work to these accuracies and part variations would ordinarily require far more complicated and costly holding fixtures. Set-up time would mount to a much larger factor, too.

In addition, it's possible to run through one or two maverick parts without going to the fuss of making a tape. You merely load the part, dial in the desired coordinate locations and proceed on manual cycle.

While this might be advantageous on occasion, basically the unit is a production machine. It's prime purpose is to tackle an entire product mix of parts with minor variations for different models.

**Works on One Plane**—In contrast to much of the elaborate computer-type equipment required for 3-D numerical control, this system is simplicity itself. Being a digital setup, you use cartesian coordinates to locate holes and regulate movement of the machine table.



**X-Y ORDERS:** Tape readout head directs operations according to X-Y coordinate dimensions punched into standard eight-channel paper tape.

After making up a conventional process sheet, you fill in coordinate locations for the three heads on a machine program. Certain auxiliary controls must be added, such as cutting fluid. With a few simple ground rules, such as basic orientation of parts, Detroit Diesel finds that both its production engineers and machine operators catch on quickly.

**Uses Paper Tape** — At present they're using a common paper tape (Flexowriter type). Since the machine routine is repetitive, the tape is joined together in a continuous circle. But it's short enough so that there's no storage problem either at the machine or otherwise.

An electrified punching unit prepares the tape. It's simple enough that any office machine operator can quickly learn the job.

For the present, process engineers are doing it to familiarize themselves with many details. If desired, a more durable plastic tape is available for the system.

While eight channels are available, only five are in use now. By plugging in a machine tape reader with the tape punch, it's possible to reproduce as many copies of a tape as wanted.

# Mechanized Hot-Dip Galvanizing Offers Major Savings

**Hot-dip galvanizing need no longer require crews of skilled workers. A new machine controls the entire cycle to produce quality work in record amounts and at low cost.**

▪ Hot-dip galvanizing of small parts by the basket-and-centrifuge method has long been something of an expensive "art."

Unavoidably, tonnage production of quality products has required a crew of skilled workers at each kettle. Eight-man crews are not unusual.

A new type of galvanizing machine aims to reduce this topheavy ratio of manpower to actual output. A flexible, portable, automatic-cycling device, it can be readily adapted to suit the needs of many job galvanizing plants.

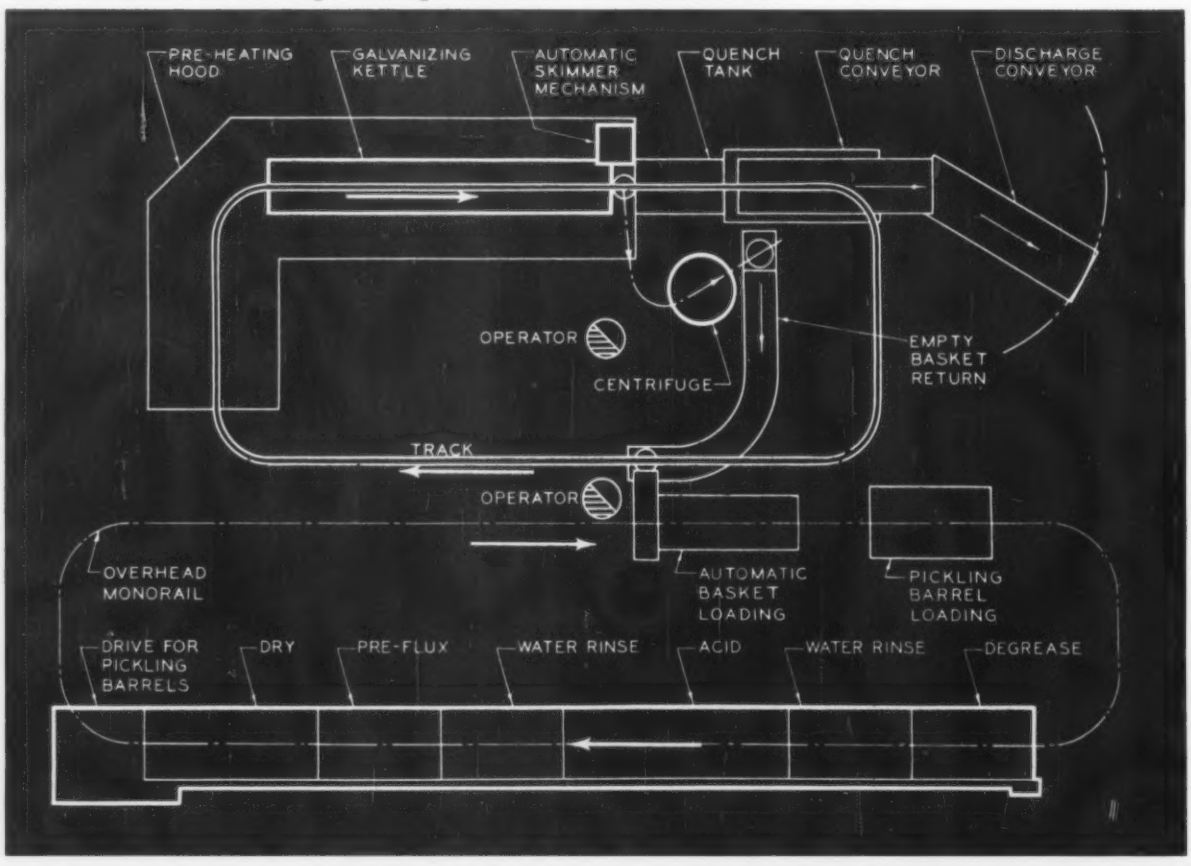
**Embraces Two Methods** — The machine is a dual-purpose unit. It will handle a broad range of products by either the basket method or the rack method.

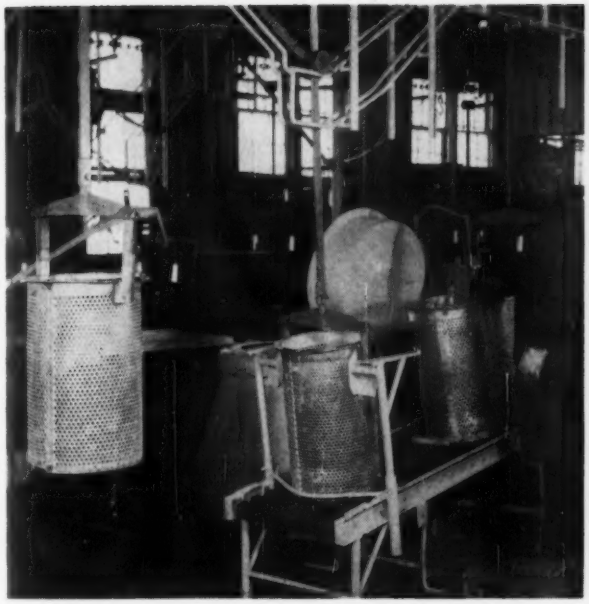
A normal operating crew consists of only two men. Neither one needs to be especially skilled, since the machine has built-in electrical timers and control devices for regulating all phases of the galvanizing cycle.

Despite this drastic reduction in manpower, the machine is designed to produce a large volume of top-quality work. According to the manufacturer, Malleable Iron Fittings Co., Branford, Conn., output of 3000 to 5000 lb of galvanized parts per manhour would be reasonable to expect with items weighing from less than 1 lb up to 100 lb apiece.

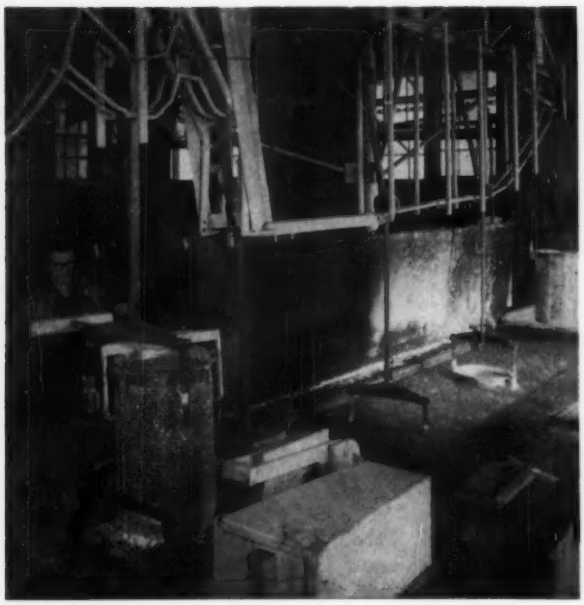
**Two in Service**—Two of the machines have already been built.

## One of Many Layouts Possible





**LOADING STATION:** Basket loading may be manual or automatic, depending on product's size and shape.



**AT WORK:** Operator at exit end of kettle controls mechanism which transfers baskets to the centrifuge.

One is in service at MIF's own plant. The other is being operated three shifts a day by a large eastern manufacturer of pole line hardware and fasteners.

Chief designer of the new machine is Mr. Henning S. Hansen, MIF's manager of galvanizing and special equipment sales. Here are details of the unit's key features as he presented them at this week's Annual Meeting of the American Hot Dip Galvanizers' Assn. in Miami Beach:

1. The basic machine design puts practically no limitations on the spelter-dip cycle. The two built thus far have a 33-in. vertical travel. However, this distance can be increased to 4, 5 or 6 ft if desired. Actually, the length and depth of the user's kettle would be the only limiting factors.

2. For any particular item, the machine can be quickly programmed to automatically control these important phases of the galvanizing cycle: (a) immersion time in the spelter, (b) length of the washing period, (c) skimming of the bath, (d) speed of basket or rack withdrawal from the bath, (e) centrifuge spinning time, and (f) quenching time.

3. The machines have multiple tracks. This makes it easy to handle two or three different basket sizes, or assemblies of racked work that occupy comparable overall dimensions. The machine now in use at the MIF plant handles baskets 16 in. deep and 24 in. deep. Change-over from one basket size to another, or to racks, or vice versa, is no trouble even when the machine is running.

4. Each machine is built as a structural unit and may be made portable for easy access to the kettle when drossing or other work needs to be done. MIF mounted its own machine on wheels so it can be rolled out of the way. Others have been designed so they can be picked up by bridge cranes or suspended from overhead tracks.

5. The number of baskets or racks immersed in the spelter at any one time can be varied to suit the installation.

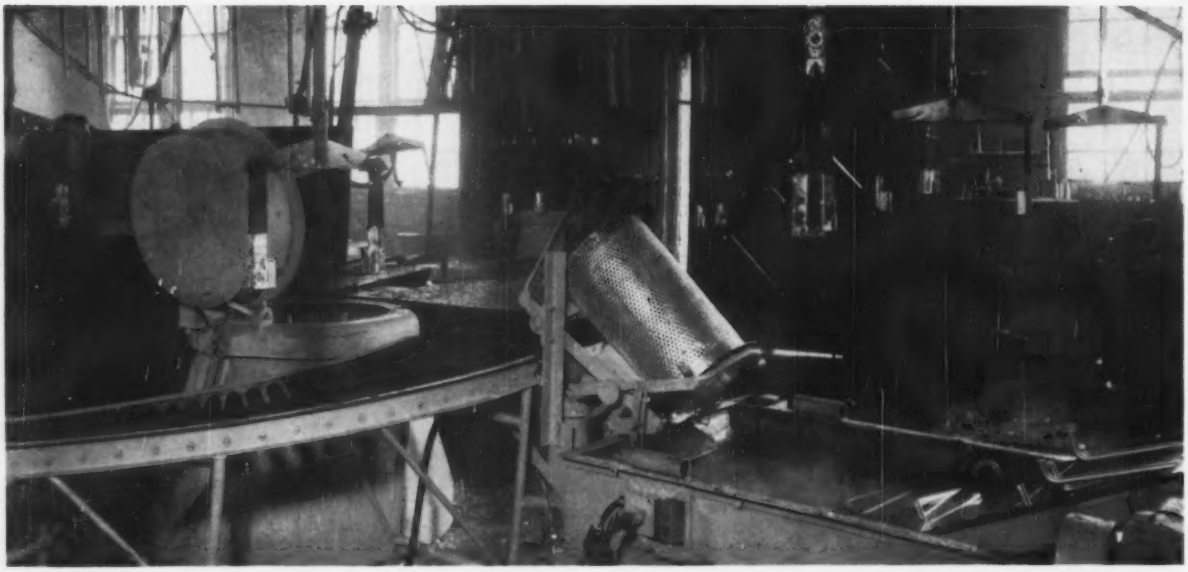
6. Because the machine is built around a standard trolley conveyor, it can be made an integral part of a large, plant-wide processing system.

**Links With Pickling Unit**—Describing how MIF uses the machine in its own plant, Mr. Hansen explained that material to be galvanized first goes through an automatic pickling system (see accompanying diagram).

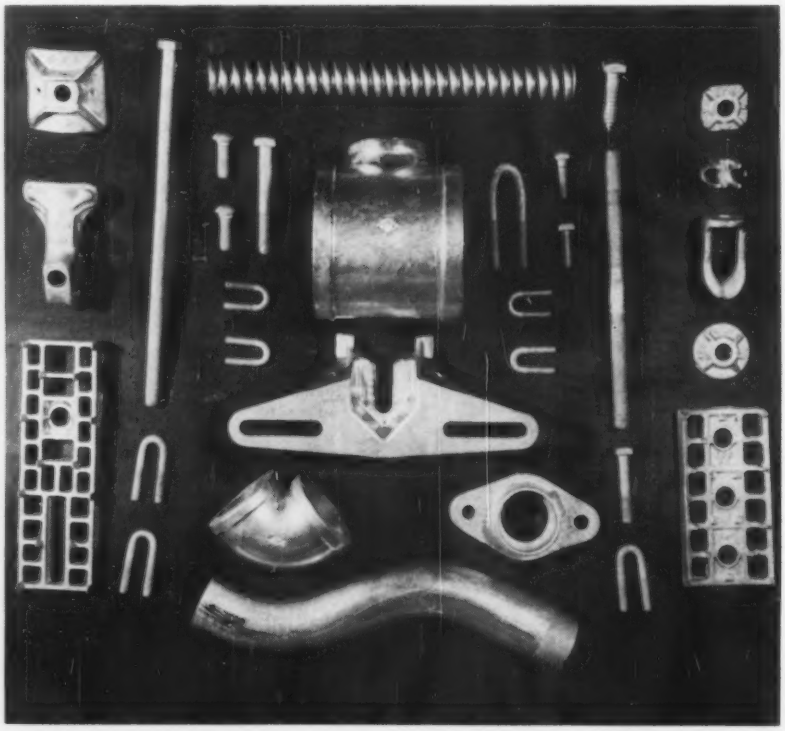
Following this, the pickled and dried pieces are deposited at the basket-loading station. At this station, empty baskets are lined up on a gravity roller conveyor which is below the main overhead conveyor track. (Basket loading may require a man at this point, but where items lend themselves to fully automatic loading, it may be possible to eliminate this worker and make the machine a one-man operation.)

**Gets Quick Dip**—When a basket is loaded, a carrier descends from the main track to pick it up and convey it to the entrance end of the galvanizing kettle. At this point the supporting trolley follows the track downward to lower the basket into the spelter as quickly as possible, yet slowly enough to prevent floating.

When the basket load of work has completed the "cooking" cycle, it is automatically washed up and down through the flux blanket. Following this, the basket remains



**LAST STEP:** From the centrifuge (lid open) loaded baskets automatically up-end at quench tank, then roll down gravity conveyor for reloading. Multiple-track machine will handle two or three basket sizes.



**QUALITY COATINGS:** Machine-galvanized hardware and fittings receive excellent finishes. The controlled cycle maintains uniform quality.

totally submerged while an automatic skimmer removes the flux blanket from the exit end of the kettle.

Immediately after this, the carrier lifts the basket up through the flux-free, oxide-free surface. The basket is then automatically disconnected from the carrier and set off at the exit end of the kettle.

**Key Control Center**—At this location, the machine operator actuates the mechanism which transfers the basket into the centrifuge. All switches and controls for the galvanizing machine and the centrifuge are conveniently located on the handle of this transfer mechanism.

Basket loads of parts emerging from the pre-timed centrifuging cycle are transferred to a device which dumps the material into the quench conveyor. Empty baskets return to the loading station via the gravity roller conveyor.

When muliple-pronged racks are used, Mr. Hansen explained that they are loaded manually. They travel through the spelter just as the baskets do, but bypass the centrifuge and follow a track which guides them through the quench tank.

To prevent parts from sticking to the racks, the latter are vibrated automatically during the quench cycle. Finally, the parts are dumped onto the discharge conveyor and the empty racks return for loading.

By offering a machine "to take the 'art' out of the galvanizing process and drastically reduce the need for skilled labor," Mr. Hansen expressed his company's hope of helping the industry's progress.

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In this 48 page handbook you'll find useful engineering and fabricating data including practical examples showing where, when and how Van Huffel Roller Die, Cold Formed Metal Shapes simplify design, increase production and reduce costs. It includes information on material selection, machine operations on shapes, fabrication methods, tolerances for roll forming, and dozens of interesting illustrated ideas that have taken shape in metal.

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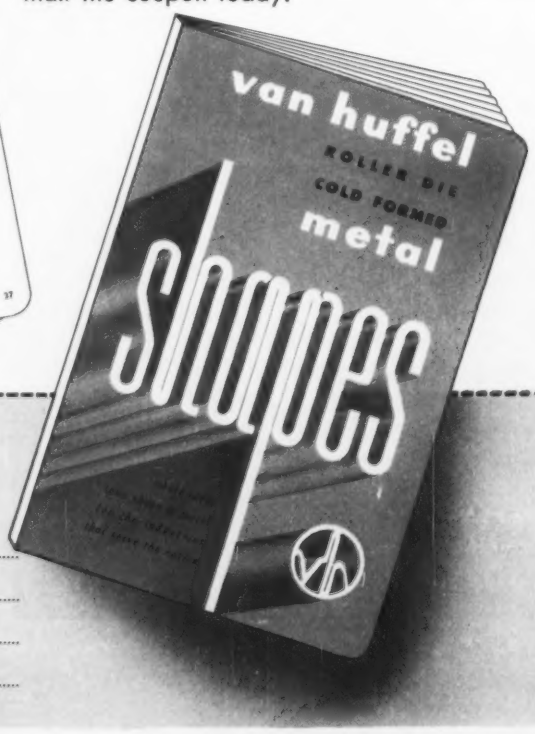


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# You Arbitrate It!

**RED CIRCLE RATE**

From the files of
The American Arbitration Association

An assistant supervisor for a valve manufacturer was demoted to turret lathe operator some time ago. His pay rate dropped from $2.05 to $1.83 an hour. There was no complaint about his work; management just decided certain record-keeping duties he did should be done by regular foremen. These weren't members of the bargaining unit.

The union didn't object to the re-arrangement of work as such. It was clearly sanctioned by the contract. This gave the company the right to transfer out of the bargaining unit work that was essentially supervisory in character.

**Pay Cut Disliked**—The pay reduction was another matter. The union thought the wage reduction was barred by a specific contract clause. It read: "Any employee who at the date of this agreement is receiving a rate in excess of the established rate for his job shall not suffer a reduction in rate."

"You can demote a man if you want to," the union's international representative argued, "but you have to pay him his old rate. That's what 'red circle' rates are for!"

The personnel manager didn't see it that way. "The agreement guarantees a man that he won't have his pay cut to the contract maximum when there are no changes in his job duties. It doesn't apply to situations when the content of a man's job changes. Otherwise, what would be the point to rearranging jobs for more efficient operation?"

The parties couldn't agree during grievance discussions. Eventually the case went to arbitration. **How would you rule?**

## The Arbitrator Ruled:

"The purpose of the clause forbidding reduction in rates was not to freeze wages under conditions of demotion," said the arbitrator. "The right to demote," he continued, "implies the right to reduce wages to the rate paid for the lower job. The clause quoted by the union guarantees employees against reduction of rates when their jobs have not changed. The contract does not require that 'red circle' rates be maintained under all conditions and the arbitrator cannot interpret it as though it did."

CAUTION: The award in this case is not necessarily an indication of how arbitrators might rule in apparently similar disputes. Each case is decided on the basis of the particular history, contract, testimony and other facts involved. Some of these essential details may have been omitted in condensing the original arbitration for brief presentation.

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A broken centrifuge at Marriner Combing Company stopped production on an important order. PLASTIC STEEL was used for on-the-spot repairs and the machine was back in operation within an hour at a cost of less than $5.00. Using conventional repair methods would involve several days and cost over $1000.

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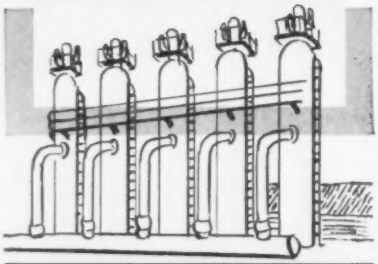
FEWER "TURN-AROUNDS"



Shutdowns for repairs of fire clay linings in refractory units are expensive. The frequency and duration of these shutdowns can be greatly reduced by the use of a steel grating armor known as "Gridsteel", which holds the castable refractory linings in place longer and armors them against the bombardment of catalytic elements.

"Gridsteel" is available in a special loose clinch to conform easily to curved surfaces.

**For complete information, write for brochure on Irving "Gridsteel" Contour Retainer Mesh**

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FREE TECHNICAL LITERATURE

# New Catalogues And Bulletins

**Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 115.**

## Electric Eyes

A 6-page bulletin covers important developments in design and application of miniaturized "electric-eyes." (Photomation, Inc.)

For free copy circle No. 1 on postcard, p. 115

## Gas Containers

A 6-page folder describes a complete line of small containers for transport and storage of liquefied gases. (Linde Co.)

For free copy circle No. 2 on postcard, p. 115

## Bearings

Featherweight ball and roller bearings are listed in a 12-page bulletin. Bearings shown come as either radial, angular contact or 4-point contact bearings. (Messinger Bearings, Inc.)

For free copy circle No. 3 on postcard, p. 115

## Nylon Shapes

Molybdenum disulphide filled nylon shapes are now available, points out a bulletin. This material has uses in: gears, rollers, bearings, washers, wear strips and pads. etc. (National Polymer Corp.)

For free copy circle No. 4 on postcard, p. 115

## Precision Tools

Tools which a machinist "would design for himself" are described in a 32-page catalog. In fact, a particular machinist did design them for himself. They were born of necessity in a machine shop. Tools include knurlers, tool posts, tap and die holders, drill attachments, etc. (R. & L. Tools.)

For free copy circle No. 5 on postcard, p. 115

## Foundry Tester

Designed for foundry use, a transverse tester for cast iron can be manually operated by foundry personnel. A mailing piece folds out to show the tester full size. The tester gives accurate technical data on the physical properties of iron immediately after the test bar has cooled. (Pasadena Hydraulics, Inc.)

For free copy circle No. 6 on postcard, p. 115

## Abrasive Disks

Coated abrasive disks are presented in a 4-page price list. The disks work sheet metal, standard jobs, soft or semi-soft metals, ceramics and special jobs. They have high particle density, more cutting edges, long life. (Abrasive Co. of America.)

For free copy circle No. 7 on postcard, p. 115

## Tools, Holders

Carbide throwaway inserts and toolholders covered in a 20-page catalog are for high speed, precision turning and boring. The catalog details: clamp type toolholders, triangular inserts, square inserts, round inserts, broached type holders, milled type holders. (Pratt & Whitney Co., Inc.)

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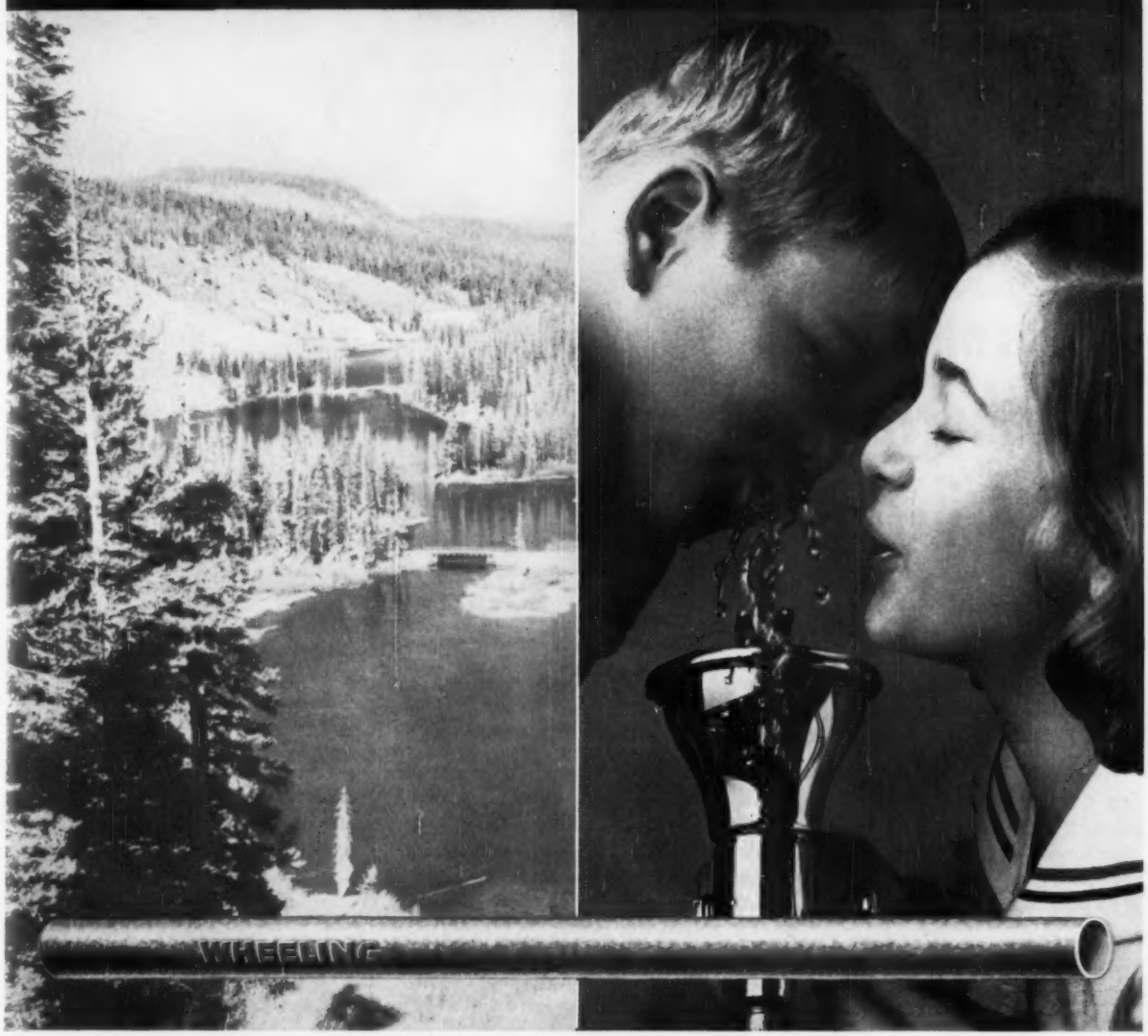
# STEEL PIPE BY WHEELING

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Water, to be useful, must be moved to where it's needed. And you can't find a better, more dependable carrier than Wheeling Steel Pipe. That's because Wheeling Pipe has the dimensional stability and inherent strength needed for this and countless other jobs.

*Now, Wheeling service and Wheeling Pipe are better than ever!* For Wheeling has just completed a $5½-million program to expand and improve its pipe making, warehousing and shipping facilities.

Get the complete story on the many advantages of Wheeling Continuous Weld Steel Pipe, both black and galvanized. See your Wheeling representative, or write Wheeling Steel Corporation, Wheeling, W. Va.

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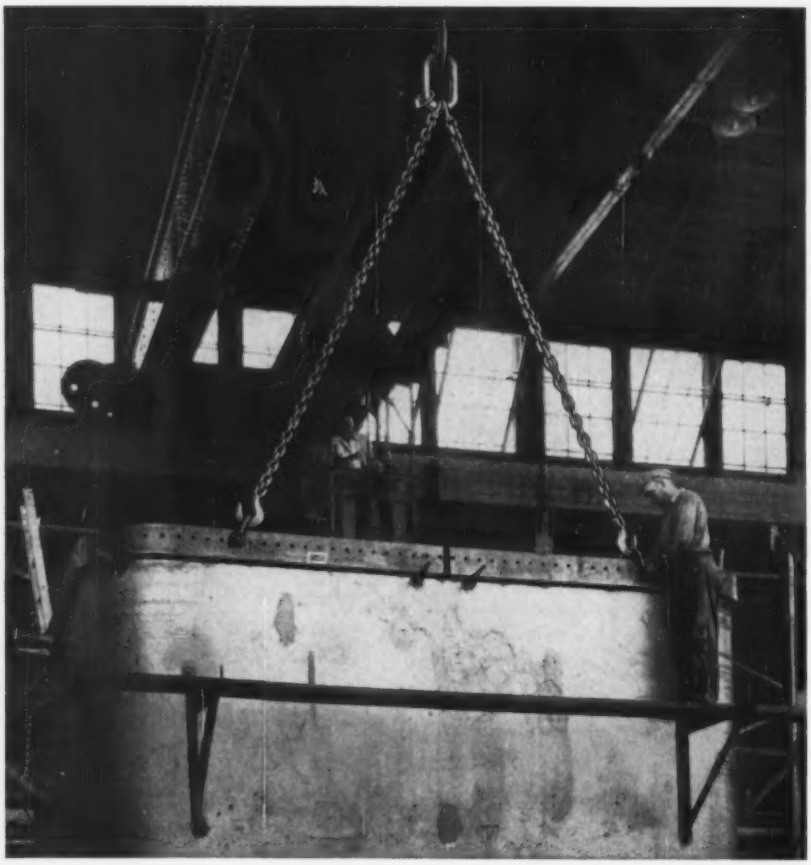

# NEW ACCOLOY KUPLEX SLING CHAINS

• Imagine... you can now get ***one-day delivery service*** on ACCOLOY KUPLEX Chain Slings like you see here from our nearby Authorized KUPLEX distributor! This really remarkable development in speedy sling service is made possible by the new KUPLEX coast-to-coast system of localized service to meet your sling chain needs. No more waiting around for shipments from the factory... no more returning damaged slings to the factory for repairs. Our KUPLEX distributor is equipped to offer you both of these valuable services, and he's as near to you as your telephone.

KUPLEX is a modern sling chain that has been tried and proved through thousands of applications. Its streamlined form greatly reduces the chance of snagging on other objects. KUPLEX Sling Chains are assembled from genuine ACCOLOY KUPLEX component parts which have been factory proof-tested at twice their specified load limits. Each part is designed and manufactured specifically for use with all other parts of the complete KUPLEX sling assembly. These matched components are made to ACCO *Registered* Specifications from heat treated ACCOLOY steel, and are engineered to be as strong as the chain itself. Hooks and Kuplers are magnaflux-tested. In addition, you are assured of complete safety—with genuine component parts—by a CERTIFICATE OF TEST issued by ACCO and signed by the distributor with each complete sling purchase.

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Accoloy KUPLEX Hook (magnaflux tested)
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• A nearby Authorized ACCOLOY KUPLEX Sling Distributor can furnish promptly from his stock the exact sling chains you need for your specific requirements; made up from the components shown above. Six chain sizes (¼" through ⅝") are available in single, 2-leg, 3-leg or 4-leg styles.

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## FREE LITERATURE

**Continued**

**These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.**

### Variable Drives

Variable speed drives are covered in an 8-page bulletin. They provide precise, infinitely adjustable output speeds from a constant rpm motor source operating from standard in-plant ac circuits. (Reeves Pulley Co., div. of Reliance Electric & Engineering Co.)

**For free copy circle No. 21 on postcard**

### Strain Gages

Etched foil strain gages are reviewed in a 6-page folder. They have uses in mechanical research and stress analysis. (Electronics and Instrumentation Div., Baldwin-Lima-Hamilton).

**For free copy circle No. 22 on postcard**

### Fasteners

Sectional drawings in a folder show typical uses of a one-piece combination tubular rivet and nut. Fastener can simplify both design and assembly. Automatic feeding and setting is via regular riveting machines. (Tubular Rivet & Stud Co.)

**For free copy circle No. 23 on postcard**

### Tracer Cutter

An electronic line tracer attachment for flame cutting machines is presented in a bulletin. Tracer follows pen or pencil line drawings. (National Cylinder Gas Div., Chemetron Corp.)

**For free copy circle No. 24 on postcard**

### Metal Finishing

Process chemicals for metal finishing are covered in a technical data file. Chemicals include: chromate conversion coatings for nonferrous metals, clear protective coatings for all metals, plating brighteners and other items. (Allied Research Products, Inc.)

**For free copy circle No. 25 on postcard**

### Packaging

Corrugated packaging problems and solutions are contained in a brochure. (Hoerner Boxes, Inc.)

**For free copy circle No. 26 on postcard**

### Industrial Trucks

When should you rebuild existing industrial trucks? When should you buy new models? These and other questions are answered in a 4-page folder. (Elwell-Parker Electric Co.)

**For free copy circle No. 27 on postcard**

### Extrusion Dies

A die catalog is available from a manufacturer of magnesium alloy mill and finished products. Full scale, dimensioned diagrams of several thousand dies show magnesium's versatility in dies for: rods, bars, tubes, structurals, solid shapes, hollow and semi-hollow shapes. (For free copy write on company letterhead to White Metal Rolling & Stamping Corp., 92 Moultrie St., Brooklyn 22, N. Y.)

### Precision Flat

Precision ground tool steel and low carbon ground flat stock now comes pre-colored. A 16-page bulletin identifies blue stock (oil hardening) and maroon (air hardening). A 60-pct cheaper thrift stock also is covered. (Brown & Sharpe Mfg. Co.)

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### Portable Grinders

Pneumatic portable grinders in a new line include both powerful horizontal and high-speed die grinders. A 12-page catalog introduces four models for filing, cutting, grinding and polishing. Speeds range from 40,000 to 60,000 rpm.



Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **4/9/59**

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# FREE LITERATURE

Heavy-duty horizontal units come in six basic models, speeds from 3100 to 12,000 rpm. (Thomas C. Wilson, Inc.)

**For free copy circle No. 29 on postcard**

## Steel and Paint

When you think of paint life, it pays to think beyond the paint itself! So emphasizes a 6-page folder which goes on to point out that the base metal has a lot to do with how long the paint lasts. It tells how a particular steel ups the life of paint used on it. (U. S. Steel Corp.)

**For free copy circle No. 30 on postcard**

## Corrosion

Got a corrosion problem? If so, it may pay to read a 24-page publication on bi-metal tubing. For condensers, heat exchangers, etc., the tubing's interior and exterior are fabricated of material best suited to meet particular corrosive conditions. Some 125 combinations are mentioned. (Bridgeport Brass Co.)

**For free copy circle No. 31 on postcard**

## Walkie Stacker

For narrow aisle use, a new electric walkie stacker is covered in a bulletin. Of 2000-lb capacity, two standard models have 68 and 83-in. collapsed heights; elevated heights can run to 124 in. (The Raymond Corp.)

**For free copy circle No. 32 on postcard**

## Fastening Tools

In 206 pages of catalog data just released is information on nut-running, screwdriving and miscellaneous production and fastening tools. (Apex Machine & Tool Co.)

**For free copy circle No. 33 on postcard**

## Expansion Joints

Rubber, neoprene and Teflon-lined expansion joints are dealt with in a bulletin. It discusses assets and limitations of seven styles of expansion joints and flexible couplings. (Garlock Packing Co.)

**For free copy circle No. 34 on postcard**

## Wire Products

Various types of wire produced at Prentiss Wire Mills are briefly described in a 6-page bulletin. Up to date, it presents a wide range of sizes for ferrous and nonferrous wire. (Riverside-Alloy Metal Div., H. K. Porter Co., Inc.)

**For free copy circle No. 35 on postcard**

## Contour Saw

More than a catalog, a 26-page brochure details a contour sawing machine that opens new vistas for fast, economical heavy machining. The unit has an articulated head. Work remains stationary. (The Do-All Co.)

**For free copy circle No. 36 on postcard**

## Heat Treating

Electric and fuel fired heat-treating furnaces are presented in a 12-page bulletin. Also covered: protective atmosphere generators. One page shows nonferrous metal melting furnaces, heat processing ovens, forge furnaces. (Hevi-Duty Electric Co.)

**For free copy circle No. 37 on postcard**

## Metal Gaskets

Spiral wound metal gaskets outlined in a bulletin find use in gas or liquid systems. They take high pressure, high temperature. Gaskets consist of spirally wound strips of V-shape pre-formed stainless or zinc coated carbon steel with layers of asbestos or Teflon. (Garlock Packing Co.)

**For free copy circle No. 38 on postcard**

## Gear Finisher

New design features improve an internal gear finisher. A bulletin says the machine performs conventional transverse or plunge shaving of internal gears. It handles gears from 12-in. OD maximum to a 4-in. minimum pitch diameter. (Michigan Tool Co.)

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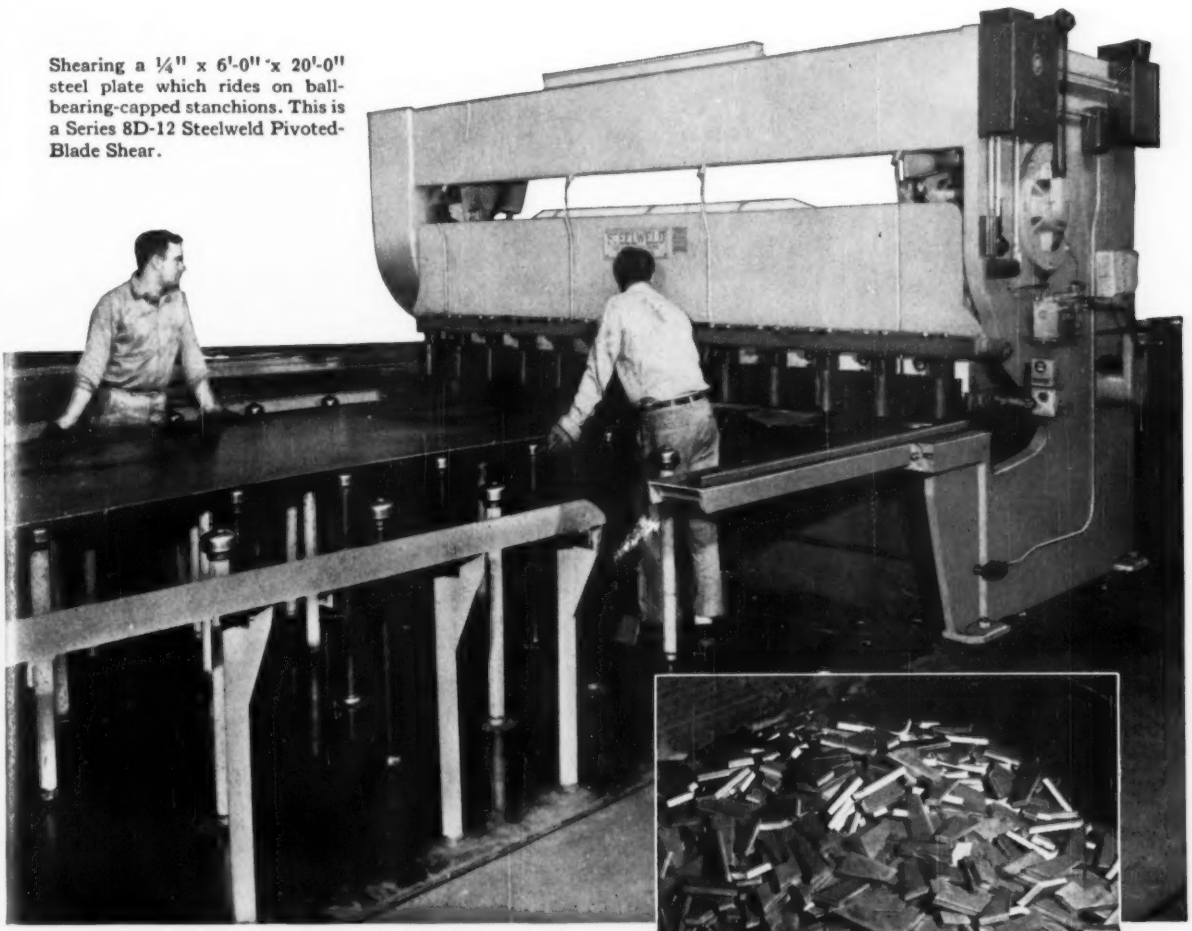
# STEELWELD SHEAR
## Serves TOUGH JOBS Well



Shearing a ¼" x 6'-0" x 20'-0" steel plate which rides on ball-bearing-capped stanchions. This is a Series 8D-12 Steelweld Pivoted-Blade Shear.

A part of an order of 120,000 gussets cut on the shear.

FOR several years a Steelweld Shear has been in operation at the Drake Steel Supply Co., Los Angeles, California. Most of the time it has been worked on a 16-hour-a-day schedule. It is used for a wide variety of shearing, mostly on 3/16-inch and ½-inch steel plate.

The machine has proven itself on all sorts of shearing jobs. A particularly tough one was the cutting of 120,000 small odd-shaped gusset plates. These were of three sizes and cut three to six at a time of ½-inch steel. The work jarred the shear terrifically, but because of its heavy construction, did not affect it in any way.

Considering the volume of work and hard service, the knives hold up very well. They need be turned only about once every six months.

*Write for free copy of catalog No. 2011*

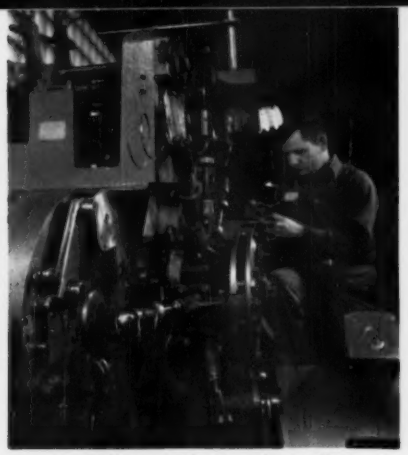
**STEELWELD**
Mechanical and Hydraulic
**SHEARS** PIVOTED BLADE

Steelweld Machinery includes: Mechanical & Hydraulic Shears and Press Brakes, One-, Two- and Four-Point Straight-Side Presses, Speed-Draw Presses.

THE CLEVELAND CRANE & ENGINEERING COMPANY · 4858 EAST 282nd STREET · WICKLIFFE, OHIO

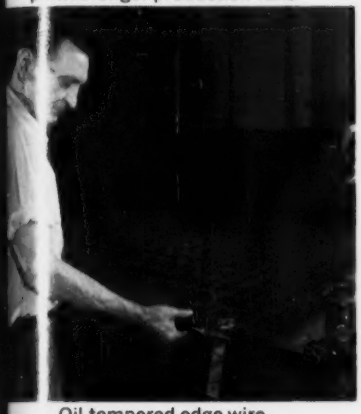
Springs for the famous Sealy Posturepedic mattress, one of the 100 different mattress constructions made by Sealy from J&L Mastercraft spring wire.

600 lb. coils of J&L wire permit longer production runs



Coilers produce spring coils 60% faster with J&L wire

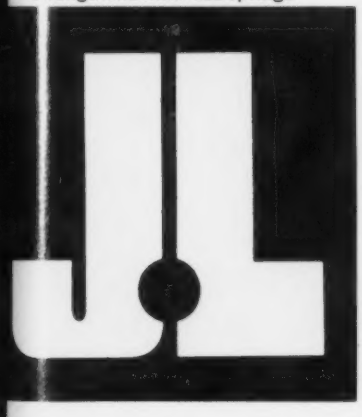
Automatic lacing machines bind round coils together

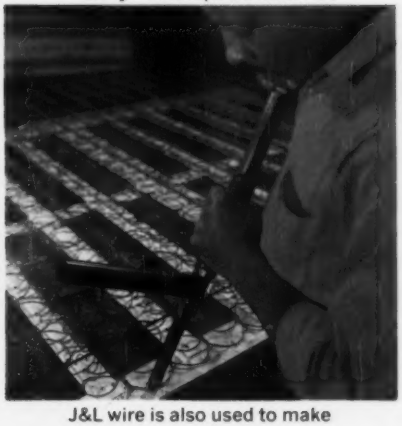


Oil-tempered edge wire strengthens mattress springs

First step in upholstering a Sealy Posturepedic mattress

Final manufacturing operation prior to inspection





J&L wire is also used to make Sealy box spring units . . .

. . . and box springs and mattresses for sofa beds

# "We can make mattress coils almost twice as fast with J&L spring wire"

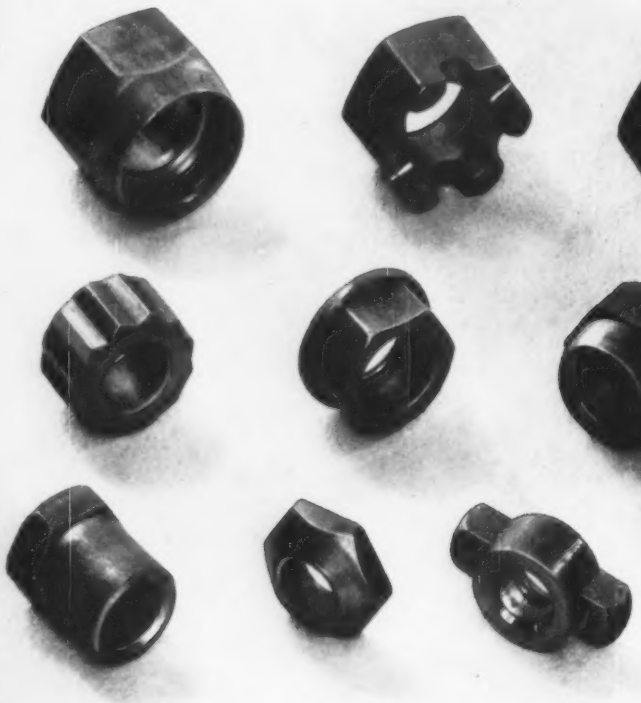
*. . . reports Sealy Mattress Company of Cleveland, Ohio*

"Profitable mattress-making operations require high-speed production of spring coils—and *every* coil must meet established specs," says Larry Higgins, plant engineer of Cleveland's Sealy Mattress Company. "Using J&L spring wire, we can run our automatic coilers at rates well above normal maximums; and the constant adjustment and readjustment of coilers has been eliminated. A single operator can now handle two or more machines instead of just one. In addition, the consistent quality of J&L wire has permitted us to switch from the standard 150 lb. coil to special 600 lb. coils for longer production runs and less down time. And we don't have to reset our machines for each new coil."

**Jones & Laughlin Steel Corporation**

PITTSBURGH, PENNSYLVANIA

# "TOUGH NUTS?...We Put Ours on NATIONAL Cold Nut Formers!"



These Unusual Nuts Are Being Made from Various Materials (Including High-Carbon) on National Cold Nut Formers.

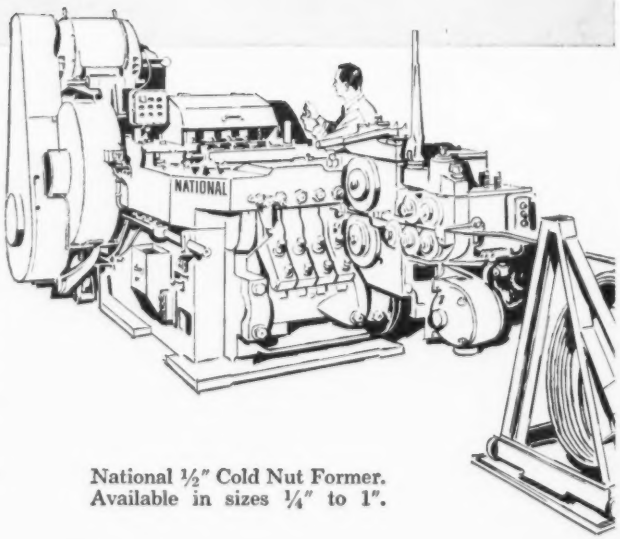
The slogan, "We Put Our Tough Ones on Nationals," is not one we dreamed up.

It sprang up in the trade, among the highly-skilled and well-equipped Nut manufacturers who have been meeting competently your "impossible" demands and your normal needs.

Have you looked into the design variations and high quality attainable these days by users of National Cold Nut Formers? If you make Nuts, or other cold-formed parts (or parts which should be cold-formed) have you considered widening your range and type of work? By offering the most modern, productive and profitable Cold Nut Formers available, we can help you meet quickly the growing demands of metalworking.

Tool design? Our working development engineers — contributing daily to the science of Metal Flow — are at your service.

Let us work with you.




National ½" Cold Nut Former. Available in sizes ¼" to 1".

*Founded 1874—DESIGNERS and BUILDERS of MODERN FORGING MACHINES • MAXIPRESSES • REDUCEROLLS • COLD HEADERS BOLTMAKERS • NUT FORMERS • TAPPERS • NAILMAKERS CO-PIONEERS WITH INDUSTRY OF ADVANCED METALWORKING PRODUCTION METHODS*

## NATIONAL MACHINERY CO.

*TIFFIN, OHIO, U. S. A.*

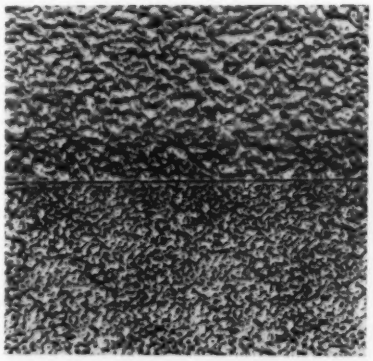
HARTFORD DETROIT CHICAGO

# New Materials and Components

## Lift-out Switch Parts Allow Fast Replacement

Any wafer of this rotary switch lifts out instantly without unsoldering or disassembling. This allows fast, easy cleaning or instant replacement. It reduces to seconds maintenance which otherwise could take a full day or more. Replacements are error-proof. No wires need be removed. Switches are available in sizes: 2 x 2 in., 3 x 3 in. and 4 x 4 in. Lengths accommodate up to 36 wafers. Choice of switch circuit configurations is virtually unlimited. All connections are to a single bank of receptacles; they're conveniently accessible from one side of the aluminum housing. Contacts are silver, gold or rhodium plated on a copper base. Wafers can include printed circuitry and components. Switches may be manually, motor or solenoid run. (Chicago Dynamic Industries, Inc.)

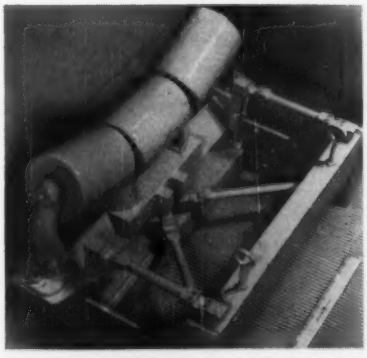
For more data circle No. 40 on postcard, p. 115



## Textured Metal Pattern Cuts Material Waste

Non directional and non repeating, a non geometric textured metal eliminates matching of secondary patterns. It results in less waste, lower labor costs. It's especially recommended for covering a wide expanse such as in architectural building panels. Made possible by a new engraving process, the texture comes in maximum widths of 52 in. Maximum texture depth is 0.030 in. It has an authentic stucco-like appearance. Economies result from eliminating matching and less scrap when shearing in any direction. Texture remains distinct even after painting or porcelain enameling. Depth and sharpness of design are reasons. (Ardmore Products, Inc.)

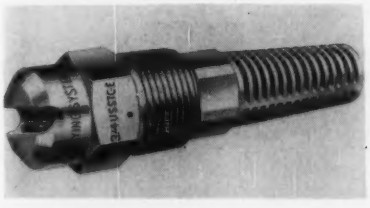
For more data circle No. 41 on postcard, p. 115



## Conveyor Component Weights Heavy Belt Loads

Continuously totalizing, this scale mounts easily between strands of any standard flat or troughed belt conveyor from 14 to 72-in. wide. Simple in design, yet it boasts rugged construction. The scale has an electrical transducer; this converts instantaneous load weight into proportional voltages for continuous integration and digital display. A new design flexure wishbone assembly restrains the scale idler in horizontal movement. It permits only measurement of vertical weight displacements. Its static hysteresis record is near perfect, the manufacturer says. System accuracy is high. Adaptable to existing plant equipment, the scale efficiently serves simple weighing processes, other systems. (Bell Automation Corp.)

For more data circle No. 42 on postcard, p. 115



## Abrasion Won't Distort This Descaling Nozzle

In a standard design, this new type descaling nozzle has very high abrasion resistance. At high pressures and large capacities normally employed in descaling, natural impurities in water ultimately affect orifice dimension and nozzle efficiency. However, this has a tungsten carbide orifice insert which maintains nozzle efficiency life up to

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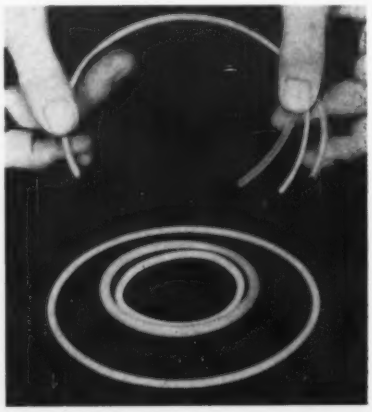
## DESIGN DIGEST

20 times. The insert is solidly enclosed by the nozzle cap to remain securely in position. These new descaling nozzles deliver a flat, extremely hard - hitting spray. Its elliptical orifice opening permits foreign particles to pass through that would normally clog a slot-type orifice. (Spraying Systems Co.)

For more data circle No. 43 on postcard, p. 115

### Silicone O-Ring

Properties of a new O-ring with a silicone rubber core permit operations under extreme conditions. The covered silicone O-ring may be used in contact with very corrosive materials. No swelling to increase O-ring size and cause extrusion has been observed after prolonged exposure to: concentrated sulfuric, hydrofluoric, hydrochloric, fuming nitric, aqua regia, strong caustic and other vigorous oxidizing materials. Coefficient of friction is exceptionally low in absence of lubricant, giving the ring a self-lubricating quality. Satisfactory service can be expected over a wide thermal



operating range, as low as 100°F, high as 300°F. The O-ring withstands high pressures. At 1500 psi, rubber O-rings are usually used with back-up rings to prevent extrusion into the gap between a piston and cylinder. These back-up rings are not required for the cov-

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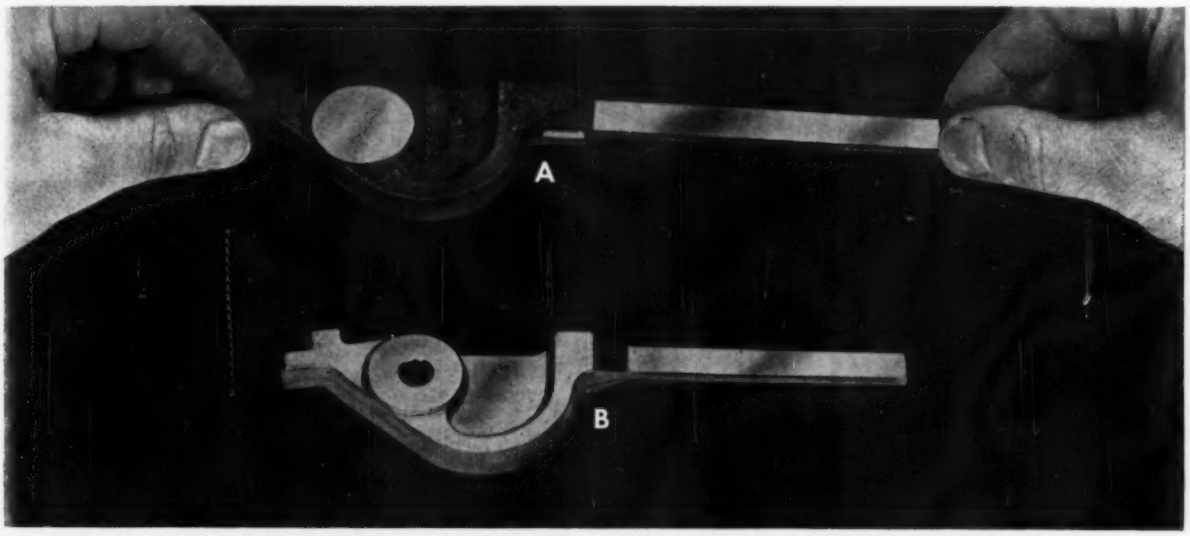
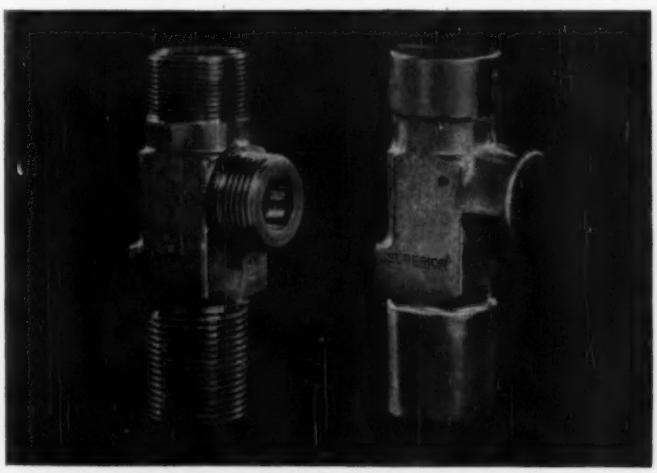
April 1, 1959.

# QUALITY CONTROL
# PLUS SAVINGS Value analysis

## suggested the use of a die-pressed forging. The result: an 85% cost reduction and a stronger, tougher part.




**SWITCH BLADE** in overspeed limiting device on large General Electric motor-generators was originally an assembly **A**—an arm brazed to a brass casting which was machined, slotted, and drilled. After review in the company's Value Analysis program, assembly was replaced by Anaconda die-pressed brass forging **B**. The superior strength of twice-wrought metal made possible a one-piece part. The excellent finish and consistent dimensional accuracy of the die-pressed forgings eliminated all machining but the drilling operation. The over-all cost is 15% of the original part.



**VALVES FOR CHLORINE AND FLUORINE** shipping containers must have unusual corrosion resistance and high strength. Superior Valve & Fittings Co., Pittsburgh, specialists in handling halogens, looked for a forging alloy that would be suitable. American Brass Company metallurgists suggested die-pressed forgings of a slightly modified Everdur®-1014, an aluminum-silicon bronze, for this chlorine-fluorine service, and this customer is finding wide use for it in other severe service, too. The twice-wrought metal of Anaconda die-pressed forgings has dense structure to prevent leaks—strength and toughness to take rough handling. Yet it can be machined in automatic-chucking machines resulting in good cost control.

THE vital job of controlling quality *and* costs may be easier than you think. Anaconda technical specialists will gladly help you find the right alloy and mill form to do both. See your American Brass Company representative or write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

**DIE-PRESSED FORGINGS SPECIAL-SHAPE TUBES**
**EXTRUSIONS FABRICATED METAL PARTS**

*products of*

**ANACONDA®**

*made by The American Brass Company*

ered silicone O-rings. The new ring deforms slightly under applied pressure, but returns to almost its original shape when pressure is released. (Fluoro-Plastics, Inc.)

For more data circle No. 44 on postcard, p. 115

## Electric Clutch

This combined electric clutch and sheave assembly directly installs on all standard NEMA electric motor shafts. Five sizes of such units, from 1 to 25 hp, fit new equipment or can modernize existing machinery. The drives provide advantages of electric no-load starting without engineering, machining and assembly costs of adapting standard electric clutches to primary shafts. They engage or release at any speed. For inching or jogging, several starts are possible in less than one clutch revolution. And there's none of what is considered normal wear-and-tear on motors, controls or machinery. Release is instantaneous; the load brakes without plugging the motor. Only a key and setscrew

are necessary to install the unit, in addition to electrical connections. Clutch, ball-bearing sheave, and shaft extension sleeve all fit as a single package onto standard NEMA motor shafts. (Warner Electric Brake & Clutch Co.)

For more data circle No. 45 on postcard, p. 115

## Wire Alloys

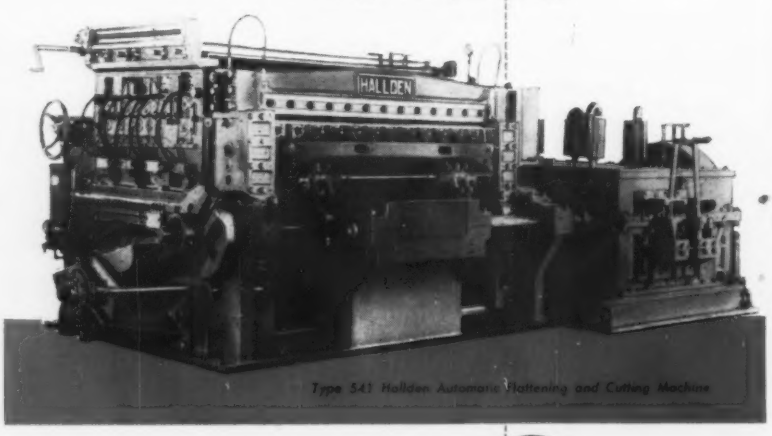
Two new nickel-silver wire alloys have many uses. A few examples: screws and rivets, slide fasteners, camera and optical parts, costume jewelry. Alloys are 18 pct and 12 pct nickel silver. They're in addition to the company's 10 pct nickel silver wire alloy. They have excellent cold working properties, can be readily formed, bent or cold headed. The alloys are suitably joined by soft soldering, silver alloy brazing, resistance or oxyacetylene welding. (Bridgeport Brass Co.)

For more data circle No. 46 on postcard, p. 115

## Speed-control Valve

This control valve is a combination needle and ball-check valve. It controls speed of a single or double-acting air or hydraulic cylinder by restricting flow from the exhaust end of the cylinder during piston movement in one direction. Movement in the opposite direction unseats the ball check and bypasses the needle-valve section. The valve controls only the fluid volume. It

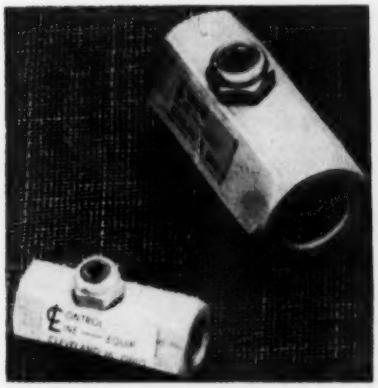
Stamco
announces
the addition of HALLDEN equipment to their complete line of steel mill equipment. Hallden and Stamco, teamed together...available from one source for complete integrated planning.



Type 541 Hallden Automatic Flattening and Cutting Machine

Stamco, Inc.
NEW BREMEN, OHIO, U.S.A.
Slitting and Coiling Lines • Cut-To-Length Lines • Flying Shear Lines • Power Squaring Shears • Automatic Resquaring • Corrugating • Culvert • Steel Mill Equipment

has no effect on incoming pressure or cylinder-output force. Aluminum valve bodies withstand to 2000-psi pressures. All other parts are stainless steel. The needle has an O-ring and lock nut for leak-

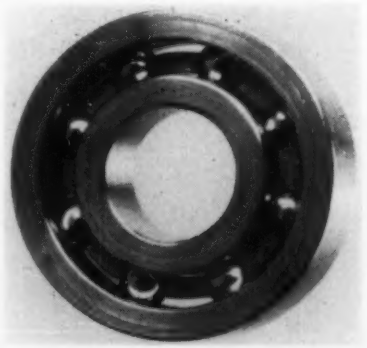


proof trouble - free performance without frequent adjustments. Valves are available for pipe sizes from ⅛ to ¾ in. (Control Line Equipment).

**For more data circle No. 47 on postcard, p. 115**

## High-heat Bearing

Deep groove radial bearings for jobs up to 900°F now come in stock in three sizes. The first has an 0.1250-in. bore, 0.3750-in. outside diameter. The second has 0.1875-in. bore 0.5000-in. OD.

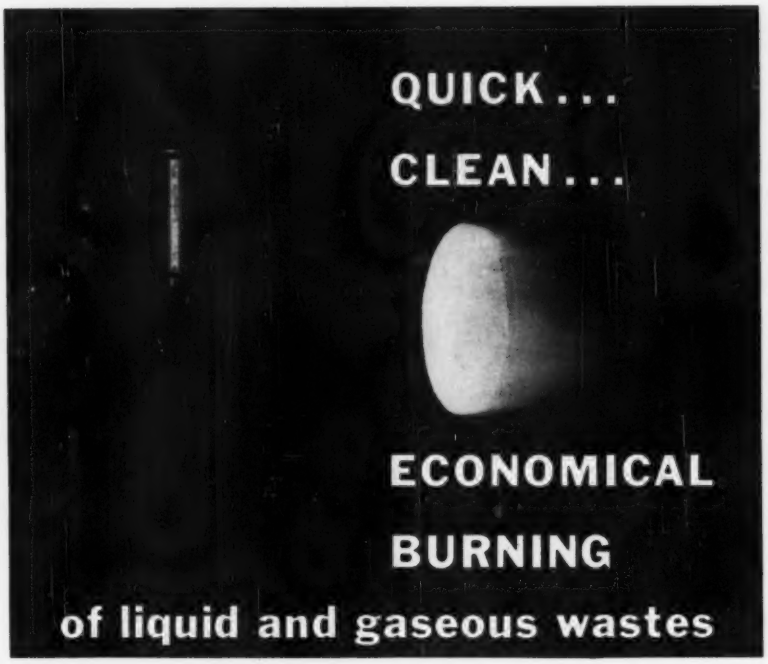


The third has an 0.2500-in. bore, 0.6250-in. OD. Material for balls, races and retainers is high speed tool steel. Retainers are machined, and of snap-in type construction. (Industrial Tectonics, Inc.)

**For more data circle No. 48 on postcard, p. 115**

## Titanium

Vacuum melted titanium now is being made by new ingot melting techniques. The process removes


**IN THE THERMAL VORTEX BURNER!**

Short, clean flame and compact size make the THERMAL Vortex Burner the perfect solution to many industrial waste disposal problems. Combustible liquid and gaseous wastes can be fed directly into the burner, eliminating the need for expensive, space-consuming incinerators. Combustion takes place quickly with an absolute minimum of smoke and odor. Where necessary, a conventional fuel may be fired to supplement the firing of the waste material. Simply and compactly designed, the THERMAL Vortex Burner can also become the nucleus of an efficient heat recovery system.

THERMAL'S laboratory facilities are available for trial burning of wastes. In addition, our staff of engineers is equipped to do complete turn-key designs to solve your waste burning problems. For further information, write for Bulletin #116.

**Some of the waste materials that the THERMAL Vortex Burner has burned include:**

1. Paint and lacquer residue.
2. Nitrogen rich petroleum residue.
3. Ethylene dichloride.
4. Aromatic water mixture.
5. Phenol tar.
6. $H_2S$
7. Nitrated and chlorinated aromatics.

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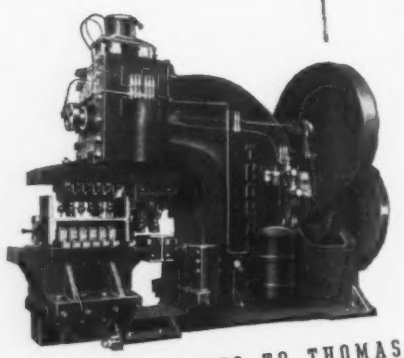
# BEAM PUNCHING

*without tool change*



THE newly designed Thomas Beam Punches are built in sizes to handle beams up to 12"-18"-24"-30" and 36", web and flange punching, with a single tool set-up. Any of the five sizes may be used with or without a Thomas spacing Table, depending on production needs.

THE TREND IS TO THOMAS

THOMAS

MACHINE MANUFACTURING CO.

PITTSBURGH 23, PA.

• *Write for further information*

PUNCHES · SHEARS · PRESSES · BENDERS · SPACING TABLES

51 a


## DESIGN DIGEST

major contaminants of oxygen and nitrogen in vacuum melted titanium ingots below 1/10 of 1 pct. This is well below the level at which embrittlement can take place. The process solves the problem of oxygen and nitrogen contaminants within the metal itself. It arc melts titanium and titanium alloys with an electrode. This contains titanium and another metal which deoxidizes and denitrides the metal being processed. (Johnson & Funk Metallurgical Corp.)

**For more data circle No. 49 on postcard, p. 115**

### Bayonet Heaters

Tantalum bayonet heaters have just been introduced which have a heat-transfer rate up to eight times greater than conventional bayonet heaters. In addition to superior heat transfer, tantalum's high ductility assures high resistance to physical and thermal shock. These virtues plus corrosion resistance suit the tantalum bayonet heaters for use in acid condensers or other process equipment. Tantalum resists most acidic environments, except hydro-

fluoric, without perceptible corrosion. Thus, extremely thin wall sections can be used—with consequent heat-transfer rate improvement. Life expectancy of the heaters (under normal service): 20 years. Bayonets 1½-in. diam are stocked in 1, 2, 3, 4, and 5 tube bundle combinations. Standard lengths are 12 to 72 in. (The Pfaudler Co.)

**For more data circle No. 50 on postcard, p. 115**

# New "washing machine" makes CLEAN stainless steel

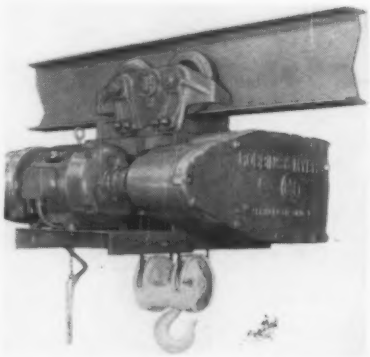
More often than not, titanium-bearing stainless can hike your fabrication costs . . . due to subsurface stringers or banding that cause excessive scrapping of parts. At Eastern, however, these harmful inclusions come out in the "wash."

Eastern's exclusive slag wash melting process produces the *cleanest* titanium-bearing stainless you can buy . . . exceptionally free from non-metallic contaminants . . . and at *no extra cost.* Eastern's new high-capacity slag furnace will meet industry's growing demand for such titanium-bearing steels as 321SW, 19-9DL, A-286, 19-9DX. Which do *you* need—and how fast?

**EASTERN STAINLESS STEEL**

**Baltimore 3, Maryland, U. S. A.**

# New Equipment and Machinery



## Electric Hoists Work with Low Headroom

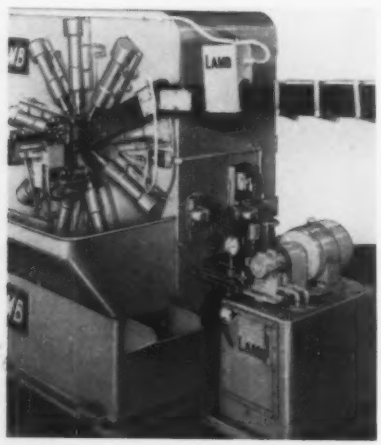
Electric hoists, capacities from 1½ to 7½ tons, require extremely low headroom. A 5-ton model takes only 24 in. of headroom. Motor and control box on the hoists are totally-enclosed, weathertight. Addition of a simple, inexpensive diaphragm at the push button station suits them to outdoor use without need of additional protection. They're powered by a 7½-hp 30-minute 55°C rise totally-enclosed motor with a weatherproof brake. This totally - enclosed magnetic motor brake is the multiple disk type. It has extremely short stroke travel to prevent peening. The brake may be adjusted externally without dismantling; only a wrench is required. (Hoist & Crane Div., Robbins & Myers, Inc.)

For more data circle No. 51 on postcard, p. 115

## Evacuator Produces High Vacuum In One Stroke

With a single stroke, this new type evacuator produces high vacuums. The instant, double-acting evacuator is of a reciprocating piston type. It's actuated by an air cylinder, producing vacuums for die cavities, tanks, hermetic sealing, packaging, etc. Its single stroke direct action is extremely fast. The unit requires no reservoir tanks or accumulators. It can connect directly to the object to be evacuated. Because it requires no auxiliary tanks, extra piping and other accessories, it's highly flexible in application. It requires only connection to a convenient shop airline outlet. Compactness and its simple operating principle means minimum maintenance and lasting service. It comes in sizes to accurately fit specific needs. The evacuator will be available in sizes and capacities for a wide range of specific applications, from 6 to 48-in. strokes. (Velvac, Inc.)

For more data circle No. 52 on postcard, p. 115



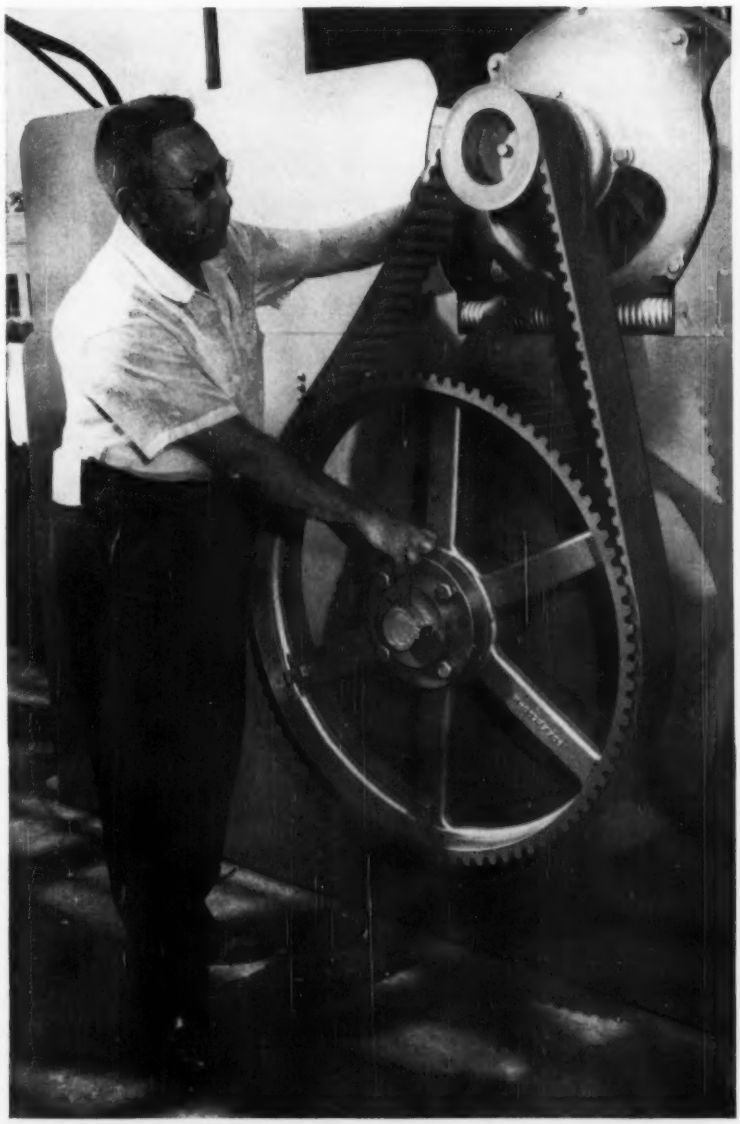

## Machine Drills 4320 Accurate Holes Per Hour

Nine 0.090-in. diam oil holes, equally spaced around the periphery of automatic transmission clutch hubs, are drilled simultaneously by this machine. Production rate is 480 parts per hour. Machine operation is completely automatic. An operator is not required. Parts are gravity fed to the machine load mechanism. A hydraulic cylinder strips each part out of the load mechanism and moves it forward into drilling position. Two gear teeth straddle a single guide rail which provides radial positioning for hole locations. The hydraulic cylinder also acts as a clamp during drilling. A disappearing locating pin in the center diameter of the part provides a bearing surface for machining thrust. All hydraulic, electric and pneumatic components conform with JIC standards. (F. Jos. Lamb Co.)

For more data circle No. 53 on postcard, p. 115

US RUBBER PowerGrip T BELT

# 9 belts replaced by a single U.S. PowerGrip "Timing" belt



Wire Machinery Co., Chicago, is a specialist in wire drawing and also a maker of wire-drawing machinery. In business for several decades, they began 5 years ago to design U. S. PowerGrip "Timing"® Belt drives into their wire drawing machinery. Their latest example of this use is on a machine in which one 3-inch 1¼" pitch "Timing" belt replaced 9 V-Belts.

"The machine turns out 1500 to 2000 feet of wire per minute," says F. C. Muntwyler, vice president. "PowerGrip brought many improvements. It runs quietly, with no vibration. No lubrication is needed. The belt always retains its permanent center distances — no adjustable centers are needed. This allows us more predictable scheduling of operations and eliminates the need for periodic inspection and adjustment."

U. S. PowerGrip "Timing" Belts are at work on production machines, power tools and appliances in every kind of industry. Their non-slip grip provides close to 100% efficiency. Stock drives are available from U. S. PowerGrip "Timing" Belt Distributors, to convert any drives from fractional to 1000 h.p.

• • •

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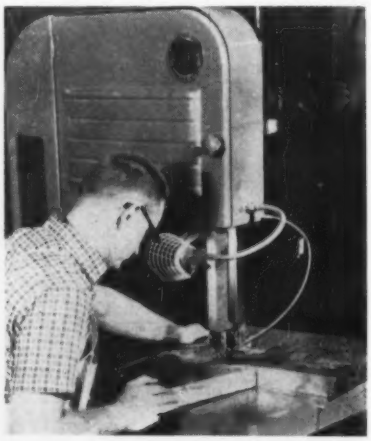
## Band Saw

Featuring a variable-speed drive, this 20-in. band saw cuts materials ranging from stainless steel to aluminum, wood and plastics. It'll do heavy-duty work in the foundry, toolroom, pattern shop or other industrial areas. The band saw is rugged, modern looking and easy to operate. Its variable-speed drive gives the operator a speed range of 50 to 4500 fpm. This insures correct speed for cutting any of 58 different materials. Exact speed for any operation sets merely by turning an easily accessible hand wheel. Unique blade guides provide long blade life—up to 100 pct more, actual tests indicate—and accurate, straight cuts. A top blade guide supports the blade down to the top surface of the work; a lower guide supports the blade to within 13/16-in. of the lower surface of the workpiece. The machine has a massively ribbed table, 24¼ x 24¼-in. This rests on two widely spaced trunnions, 17-in. apart. To provide



extra table rigidity for accurate work on heavy dies, etc., the unit has an adjustable table support. (Delta Power Tool Div., Rockwell Mfg. Co.)

For more data circle No. 54 on postcard, p. 115

## Descaling Unit

Working by compressed air, a new tool de-rusts, cleans and descales. Swiss-made, the tool's air supply can come from any industrial type compressor. Action produced by the tool is a spring loaded

recoil movement of hardened steel needles located in its head. Non-sparking copper brillium needles also are available. Action of these needles is controlled by a trigger on the handle releasing a flow of air. This sets the needles into rapid back and forth action. Air con-

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tinues on through the pistol blowing the working surface clean from particles. Each needle operates independently from the other. This allows them to adjust to the contour of the surface being cleaned. Needle life is approximately 200 to 400 hours and the cost per hour of operation varies from 7 to 10 cents. Normal working air pressure is 88 psi; air consumption is 12.5 cfpm. A series of units can work as a gang. (Swissair Tool Corp.)

For more data circle No. 55 on postcard, p. 115

## Environment Gage

Sensing environmental changes with extreme sensitivity is a new electrical resistance "probe." In theory, the probe measures corrosion; in practice, its main use is measuring hard-to-detect liquid and gaseous contaminants. The probe detects the slightest change in humidity, ozone concentration, water content in a non-aqueous liquid, or other environmental conditions which have a tendency to attack metal. (Crest Instrument Co.)

For more data circle No. 56 on postcard, p. 115

## Portable X-ray

Small enough to pass through a 6-in. opening, a 50-lb X-ray unit is powerful enough to radiograph 1¼-in. steel in 45 seconds. The 140-kv X-ray generator is designed for quick on-the-job inspections by one man. It can radiograph pipelines, pressure vessels, castings, aircraft, missiles, storage tanks, tank cars, ships, and the like, for the detection of inner flaws in the metal. (Picker X-Ray Corp.)

For more data circle No. 57 on postcard, p. 115

## Radial Machines

For drilling, boring and tapping, new radial machines come in column sizes of 13, 15 and 17 in. Arm lengths are from 5 to 8 ft. Either 12 or 24 spindle speeds are supplied depending on whether a constant speed or two-speed motor is mounted on the head for driving. These driving motors are available in 5-hp and 7½-hp sizes. Bases,

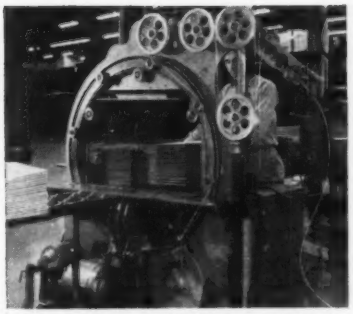

# How much can you save with the right strapping and equipment?

**Save as much as 50-80%** on strapping materials alone. Hundreds of users report savings as high as 80% when *oval* steel strapping is substituted for their present materials. This doesn't mean that oval is a cure-all. Your specific packaging problem might best be solved with flat steel strapping, or wire . . . or pressure sensitive tape. No single strapping material has a precedent in our recommendation. We offer all types. It all depends on which will do the best, *lowest cost* job for you.

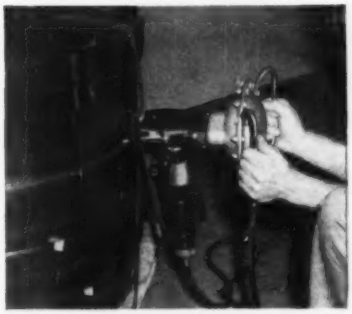
**Be sure the equipment is right.** Maybe the strapping material isn't your problem. Possibly your best cost-cutting advantage will result from the type of equipment you're using. Perhaps with your volume, you could cut costs tremendously with Power Driven equipment. Or maybe you need Fully Automatic equipment, or an improved manual tool. Here again, we are unbiased. We offer you a complete line of *all types* of strapping tools and equipment. The determination is *what do you need?*

**Maybe you're over-protecting.** Possibly you're not only using strapping that is heavier than necessary . . . but you might also be using the wrong strapping *methods*. The soundest way to judge right from wrong on *your* packaging problem, is to go over every detail of your operation with a *seasoned* expert. Your representative from A. J. Gerrard is such a man.

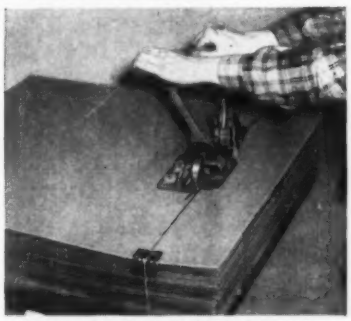
**What's your specific problem?** Allow us to gather the details. Then let us apply this information to determine the best material and methods for you. Maybe your present practices are right. Maybe we can help you improve upon them. A personalized survey is yours for the asking. Simply use the coupon below.



FULLY AUTOMATIC EQUIPMENT is available for the application of flat steel strapping, round steel strapping or pressure sensitive tape.



POWER DRIVEN EQUIPMENT can slash your time and manpower requirements. A personalized survey by A. J. Gerrard will determine if powered equipment fits your operation.



JUST ONE OF MANY WAYS that this package could be strapped is demonstrated here. This method saves the user as much as 75% on strapping materials alone.

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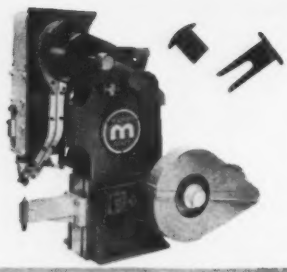
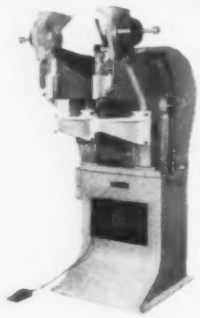


**CUT RIVET ASSEMBLY COSTS**



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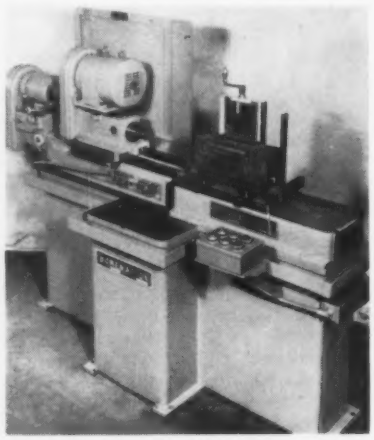
column and arms are proportioned to resist thrusts imposed by severe jobs permitted by the size of the driving motor. The radial machines cut costs especially where more expensive higher capacity radial drills are now in use than are necessary. They perform a variety of drilling, tapping and boring operations. (The American Tool Works Co.)

For more data circle No. 58 on postcard, p. 115

## Gundrill Machine

Secondary drilling, boring, reaming and honing operations can be eliminated with this gundrilling machine. Its key feature is lack of vibration. Resulting rigidity means long tool life, excellent hole finish and accuracy in hole alignment. Accuracy and finish in many applications are sufficient to eliminate further work. Feed is infinitely adjustable from ½ to 30 ipm. Spindle speeds range from 100 to 10,000 rpm. Selection of feed or speed is



made easily by the operator. Feed and speed is constant once made. The gundrill machines come in two standard sizes. One has a 12-in. stroke, the other a 24-in. stroke. (Drillmation Co. Inc.)

For more data circle No. 59 on postcard, p. 115

## Corrosion Preventive

A liquid additive to hot-water rinses prevents spotting and subsequent corrosion of metals. It causes rinse water to shed rapidly from the metal surface resulting in fast drying and eliminating "water spots" and stains. At the same time, it leaves a strongly absorbed, invisible film on the metal surface which protects it from tarnishing and corrosion for months. (Enthone, Inc.)

For more data circle No. 60 on postcard, p. 115

## Spark Tester

Spark testing is a long established way of quickly identifying steels. Sparks thrown off when steels are held against a high-speed grinding wheel tell the story. Spark testing

is fast, convenient, economical. With proper regard for its limitations, it's reliable and accurate, too. To help spark testers, a new device is available. It's a collection of popular grade tool steels. Each type has its own spark characteristics. To identify an unknown grade, you merely spark the unknown, then the various standards, until similar sparks appear. The device can include any set of AISI-SAE code or trade name specialty steels. (GLD Products Co.)

For more data circle No. 61 on postcard, p. 115

## Weld Shaver

Removal and finishing of weld beads by multiple grinding and sanding are done in one operation with this weld shaver. Two models are available to flush-finish stainless steel, titanium or aluminum weldments. The portable shaver uses a rotary cutter. This removes excess filler and shaves weld beads. The cutter mounts between adjustable rollers which straddle, and follow, the weld bead on flat, convex or

# New book tells full story of stainless pipe and tubing

If you use stainless or high alloy pipe or tubing, this new illustrated handbook was written for you. It's 58 pages big – packed with informative data that you'll refer to again and again.

The table of contents is too long to list here, but it includes, for example, analysis and conversion tables, corrosion characteristics, weights, alloy properties, bending, joining and installation hints.

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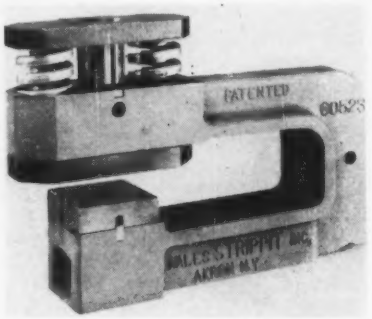
concave surfaces. Precise shaving is achieved via a finger adjustable indexing ring. This lets the operator increase or decrease cutter depth in increments of 0.0005 in. A locking device fixes cutter position once proper depth is reached. Exhaust air blows chips away from the work surface and keeps the cutting head cool. One model, for stainless, steel

and titanium, operates at 3000 rpm. It's 11½-in. long, weighing 9½ lb. The other model for aluminum, copper, brass and magnesium, operates at 11,500 rpm. It's 9½-in. long, weighing 7½ lb. (Zephyr Mfg. Co.)

**For more data circle No. 62 on postcard, p. 115**

## Punching Unit

A new press-actuated hole punching unit can quickly alter from 0.250 to 0.750-in. capacity in mild steel by changing stripping mechanisms. Consisting of a single heavy-duty holder for both capacity ranges, the unit has a readily removable punch assembly, and two lift-out stripping springs. With mechanical springs in place, the unit has stripping pressure suitable for the lower capacity work. By




replacing these with hydraulic springs, stripping pressure is greatly increased for heavier work. The conversion takes only a few seconds. The new units also feature removable round, obround, square or shaped punch tips and dies. The punch body is keyed to the holder to maintain accurate alignment. (Wales-Strippit, Inc.)

**For more data circle No. 63 on postcard, p. 115**

## Rust Remover

For removing rust, scale and black oxide from steel, a single dry salt is a new, non-acid material. It will not attack the base metal. It's dissolved in water at a ratio of from 1 to 4 lb per gal and the solution is used at 180°F to boiling. If necessary, it can also be used electrolytically. (Du-Lite Chemical Corp.)

**For more data circle No. 64 on postcard, p. 115**


**New King-Sized DUMPMASTER Automatically Collects and Hauls Up To 120 cu. yds. of Refuse per Trip**

**DEMPSTER BROTHERS' Newest Addition Cuts Waste Disposal Costs**

The famous DEMPSTER-DUMPMASTER 24DB now has a big brother in the CA60-30DB model. Like the original Dumpmaster, it automatically handles detachable containers in one through six cubic yard sizes. However, it can pick up a gross load of 6000 pounds as compared to the 24DB's 3000 pound capacity.

Another important difference in capacity—the new model can compact up to 120 cubic yards of loose refuse while the 24DB gets up to 100 cubic yards per trip. Like all Dumpmasters, the new 30DB has clearance arms for safety . . . they never pass the cab windows . . . can't injure the operator.

**Write For FREE BROCHURE**

Shown above is the Dempster-Dumpmaster CA30-24DB model which has a capacity of 100 cubic yards of loose refuse material

Shown above is the CA15-18DB which has a capacity of 72 cubic yards of loose refuse material

Patents Pending
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To meet demands for ever-higher operating temperatures to speed steel production, Grefco introduced the revolutionary EE *internally-plated* basic brick. Permitting a phenomenal growth in the number of "All-Basic" open hearth furnaces, and capable of withstanding the far more punishing heating-and-cooling cycles of modern, heavy-oxygen steel production, *The GREFCO "EE" HAS MADE POSSIBLE A DEVELOPMENT BREAKTHROUGH IN STEELMAKING.* Most significantly, the world's open hearth steel production record, exceeding 100 tons per hour, was recently established by a Grefco-equipped "All-Basic" furnace.

Through constant research and development of new and improved products, Grefco maintains its traditional leadership in the field of basic open hearth refractories.

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Never before have all the values of this new plan been available to you—from Ryerson or from any other source. Outlined here are some of the principal advantages—each representing many possibilities it will pay you to explore.

### INVENTORY ADVANTAGES

1. Ryerson inventories now at all-time high. No others anywhere even come close in size and diversity.
2. The newest steels first. Typical examples: LEDLOY® tubing, LEDLOY 375 bars, new leaded alloys.
3. Hard-to-get intermediate sizes and special analyses—plus, of course, practically all standard types and sizes.
4. High inventories are scheduled to be maintained throughout the year, *regardless* of market conditions.

### VALUE ANALYSIS ADVANTAGES

1. New quality-control standards, completely detailed and published, govern every aspect of the specifications, inspection and certification of *all Ryerson products.*
2. New closer cutting tolerances assure greater accuracy than ever before available.
3. The industry's most experienced specialists—well qualified to work with you on problems of selection fabrication and "costs of possession" analysis—help you achieve optimum value in purchase *and* use of steel, aluminum, industrial plastics and metalworking machinery.

### BETTER SERVICE

1. Stepped-up processing assures even faster, more dependable delivery of regular requirements.
2. Unequaled capacity to serve—a combination of expanded stocks, equipment and staff—means unequaled ability to meet the most urgent emergency needs *faster.*

### MORE FOR YOUR PURCHASING DOLLAR

In addition to all the advantages listed above, you build a business relationship with a company that:

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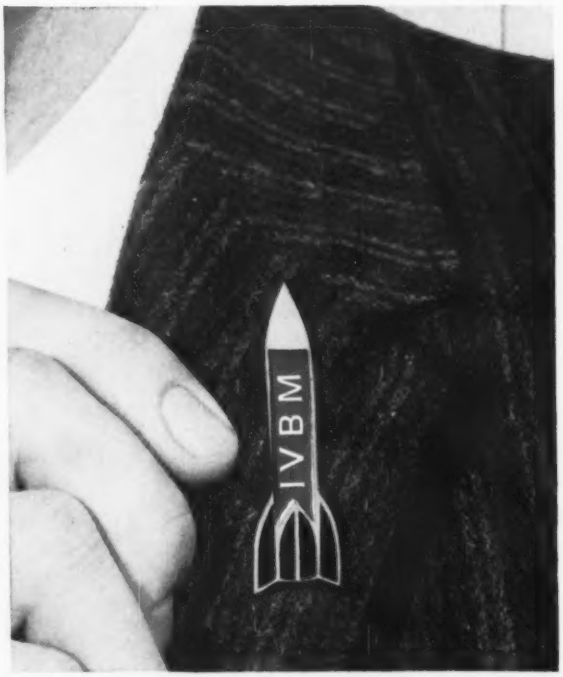
Your Ryerson Representative can show you how Ryerson products and services are saving money, improving quality and stepping up production for hundreds of companies. Just ask him what's behind that rocket lapel pin he's wearing, and what it means to you.

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## The Iron Age Summary

# Some Steel Users Play Long Shot

**These companies are not interested in building inventory because they look for peaceful settlement of steel labor talks.**

**The long shot could pay off, but pre-negotiation posture of steel labor and management is not too encouraging.**

■ Some steel users are taking the long gamble. They're going along on the assumption that there won't be a steel strike; or if there is one that it will be short-lived.

**These are the companies who are making no great effort to build strike-hedging steel inventories. They figure this way:**

**(1) If there is a strike they can scrape up enough steel to get by for a couple of weeks. They're banking on steel from service centers (warehouses) and, possibly, foreign imports.**

**(2) As soon as a strike starts, they will complain long and loud that the walkout is threatening to halt their operations. The longer the strike lasts, the more voices will be added to the chorus.**

**(3) They believe this pressure will force President Eisenhower and other public officials to "do something" about ending the strike and thus get them off the hook.**

**A Long Shot**—Admittedly, it's a long shot. But it could pay off, and thus the non-hedger will be that much farther ahead in terms of money invested in inventory.

Still, the pre-negotiation posture of steel labor and steel management is anything but encouraging even if you discount some of it as "propaganda" or "window dressing." The issue to be resolved is basic: Can a settlement be negotiated that will (1) give the union enough of an improvement to save face, and (2) be low enough in cost to justify holding the line on steel prices?

**Ike Will Act**—President Eisenhower has made it plain he will be an active "bystander" in the steel labor negotiations. He's got to be if he hopes to see the kind of settlement he wants, namely, a modest steel wage increase but no steel price increase.

**Here's one thing to keep in mind:** There is no such thing as a "quickie" steel strike. It takes three to four days for an orderly shutdown of a big steel plant, and about as long, or longer, to get back to the production level that prevailed before hope for a peaceful settlement was abandoned. And the longer the strike, the longer it takes to restore full production.

**Keeping Powder Dry**—Although hoping for a peaceful settlement of labor talks, most steel users are "keeping their powder dry," so to speak. They're trying to lay in an inventory of about 60 days in the belief that even if there is a strike, it will be settled before 60 days are up.

Hanging over the heads of everybody was the probability that by June 30 the mills will be running from two to three weeks behind on delivery promises. A possible shortage of freight cars also looms.

### Steel Output, Operating Rates

| | This Week | Last Week | Month Ago | Year Ago |
|---|---|---|---|---|
| **Production** (Net tons, 000 omitted) | 2,646 | 2,646 | 2,604 | 1,308 |
| **Ingot Index** (1947-1949=100) | 164.8 | 164.8 | 162.2 | 81.4 |
| **Operating Rates** | | | | |
| Chicago | 95.0 | 94.0 | 94.0 | 55.0 |
| Pittsburgh | 97.0 | 94.5* | 91.5 | 48.5 |
| Philadelphia | 97.0 | 98.0 | 97.0 | 50.5 |
| Valley | 90.0 | 88.0* | 84.0 | 37.5 |
| West | 93.0* | 93.0* | 87.5 | 67.5 |
| Cleveland | 96.0 | 98.0* | 93.0 | 31.0 |
| Detroit | 99.0 | 97.0 | 100.0 | 13.0 |
| Buffalo | 105.0 | 105.0 | 105.0 | 39.0 |
| South Ohio River | 90.0 | 90.0 | 93.0 | 41.0 |
| South | 91.5 | 90.0 | 88.0 | 47.5 |
| Upper Ohio River | 96.0 | 95.5 | 93.0 | 73.0 |
| St. Louis | 81.0 | 85.0* | 80.0 | 59.0 |
| **Aggregate** | 93.5 | 93.5 | 92.0 | 48.5 |

*Revised

### Prices At a Glance

| (Cents per lb unless otherwise noted) | This Week | Week Ago | Month Ago | Year Ago |
|---|---|---|---|---|
| **Composite price** | | | | |
| Finished Steel, base | 6.196 | 6.196 | 6.196 | 5.967 |
| Pig Iron (gross ton) | $66.41 | $66.41 | $66.41 | $66.49 |
| Scrap No. 1 hvy (Gross ton) | $36.50 | $37.83 | $41.17 | $33.50 |
| No. 2 bundles | $24.17 | $25.83 | $29.00 | $24.83 |
| **Nonferrous** | | | | |
| Aluminum ingot | 26.80 | 26.80 | 26.80 | 26.10 |
| Copper, electrolytic | 31.50 | 31.50 | 31.50 | 25.00 |
| Lead, St. Louis | 10.80 | 11.30 | 11.30 | 11.80 |
| Magnesium | 36.00 | 36.00 | 36.00 | 36.00 |
| Nickel, electrolytic | 74.00 | 74.00 | 74.00 | 74.00 |
| Tin, Straits, N. Y. | 103.00 | 102.375* | 102.00 | 92.00 |
| Zinc, E. St. Louis | 11.00 | 11.00 | 11.00 | 10.00 |

# Drive Equipment Sales Move Up

**Makers of gears, hydraulic drives, and belting are chalking up solid, steady gains in orders.**

**Right now prices are stable, but wage increases in steel or rubber industry will mean increases after mid-year.**

▪ Mechanical drive sales continue to show solid gains. Deliveries of gears, hydraulic drives, clutch equipment, and belting are starting to stretch out. But the delays are not yet sufficient to be a real problem to buyers.

**Belting Stockpiled**—The biggest question mark is in belting. The rubber workers are expected to go on strike April 15, in what's expected to be a very long, tough labor-management struggle.

Belting suppliers have doubled their rubber stocks, but are still warning customers to expect significant delivery problems during second quarter.

It's felt that most belting distributors have protected themselves by boosting stocks over the past 30 days. Nonetheless, rubber belting is a product to watch if your stocks are low.

**Gears Head for Peak**—Gears, the wheelhorse of the mechanical drive industry, are displaying steady sales improvement. The industry normally peaks during the May-June period. This seasonal peak is historically preceded by a slow upturn during first quarter. This pattern has generally been followed. Some firms now expect to see as much as a 15 pct boost in April business over March levels.

This improvement hasn't greatly extended deliveries so far. Gears are still obtainable in as little as six weeks delivery from some job shops. Production work can be had in 8-10 weeks, though this may require some shopping.

The increasing tightness of steel plate, bars, and large rounds, hasn't affected deliveries of gears. That's because most gear producers have put in ample inventory to cover gear orders on their books. There are indications, however, that deliveries will extend by as much as 2-4 weeks during April. Primary cause will be the difficulty in obtaining some types of steel.

**Prices Stable** — Belt and pulley, and hydraulic drive business, hasn't shown quite the gains established by gear manufacturers, but business in these lines is definitely 17-25 pct above last year's levels. Forecasts for belting gains this year suggest 1959 will run as much as 20 pct over 1958.

Prices for all drive equipment are solid at current levels, with few indications of any important increases. It's generally acknowledged that any increases in the base price of steel and rubber will be reflected almost immediately in gear and belt prices. The wage package being presented by the rubber workers could, if not hammered to lower levels during negotiations, result in a price increase of 10 pct or more.

Belting industry sources point out a price increase is particularly dangerous at the present time, since foreign materials are already moving into the U. S. market in growing quantity. A price increase, they believe, would accelerate this.

**GAINS FOR GEARS:** Gearmakers will carry first quarter sales improvement into their normally busy second quarter. (Alco Products photograph.)

# NON-FLUID OIL

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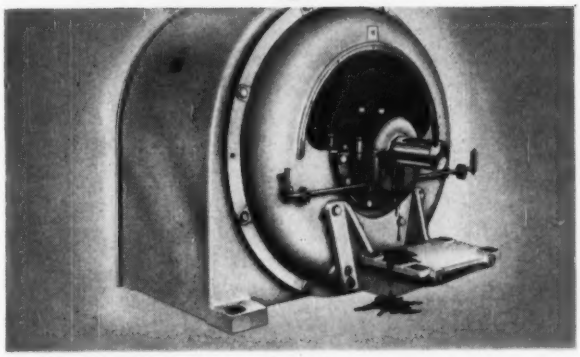

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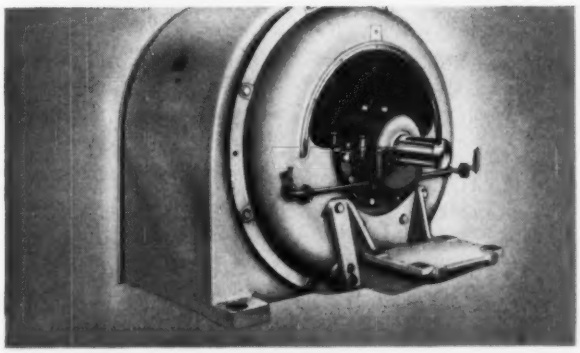

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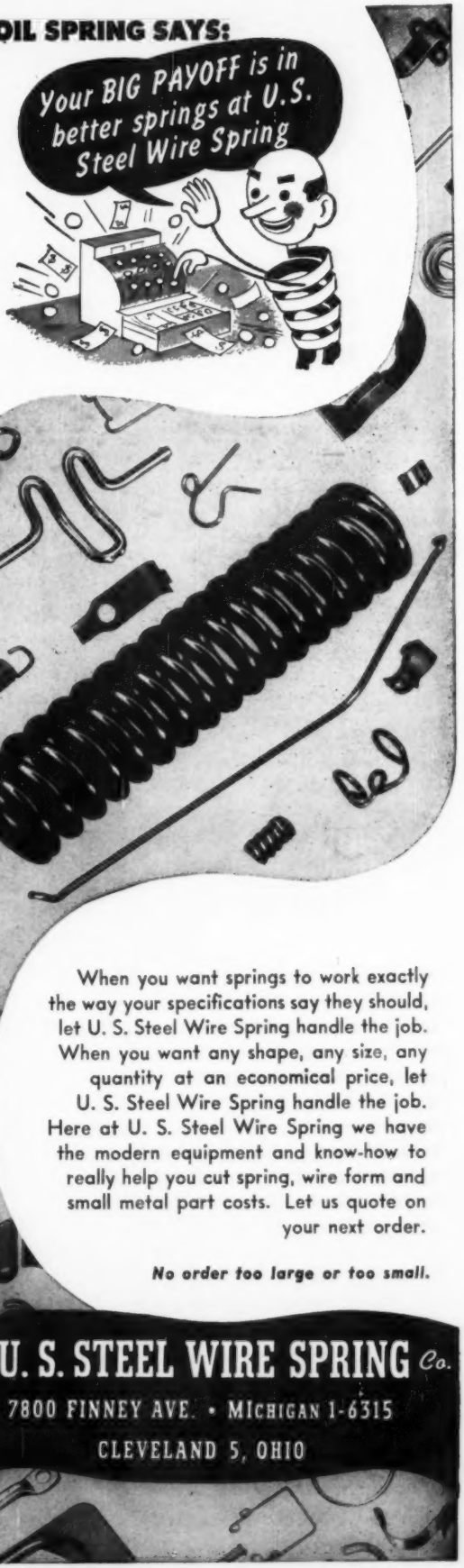


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# How Lean Will Sales Be This Summer?

**Forecasts that the steel market would be virtually dead this summer have been revised.**

**Some users will want third quarter steel as soon as it is available.**

▪ Will steel mills find sales as lean as expected this summer—assuming there's no strike?

Originally it was believed the market would virtually go to sleep, with steel users living off accumulated inventories.

Now these forecasts are being tempered. Some buyers have not been able to enlarge stocks as much as they wished. For others, rising production schedules have kept ahead of inventory rebuilding. And a few users, as noted in the Steel Summary, are taking a gamble and not worrying about building stocks.

Many of these steel users will be in the market for third quarter steel —as soon as it's available.

Right now only a trickle of July-September orders is coming in to mills. But, where mill books are open, some steel is being bought—even as far ahead as the fourth quarter. Medium- and small-sized companies who can estimate steel needs that far ahead are not hesitating to place orders.

Placing third quarter orders now has a built-in advantage, strike or no strike. Mill carryovers are beginning to pile up. There are prospects the steelmakers won't be able to erase these delivery deficits by June.

Then, if there's no strike, carryover orders will be filled first, followed by third quarter orders. The same procedure will be followed after any steel strike is settled.

Steel buyers ordering now for post-June delivery may be avoiding third quarter headaches.

**Sheet and Strip**—July orders for flat rolled products have picked up in the last week. Many sheet mills have now opened third quarter books, even those which could be struck by the Steelworkers.

**Pittsburgh** sheet mills report new orders for second quarter delivery have finally tapered off. Mill backlogs of unshipped orders are also starting to decline.

Sheet delinquencies at **Cleveland** are not bad, but spring floods are causing some delays. At **Chicago** mills carryovers average about three weeks and seem to be increasing. Some **Detroit** area mills are also in arrears on shipments.

**Bar**—Bars remain less critical than sheet, but are in strong demand. An **East Coast** mill — sold out through the first half on sheet, strip, and plate—can still offer May and June delivery on bar. At **Cleveland,** non-automotive types of bar and small angles are available for June shipment. Auto and forging sizes of bar are tight. **Detroit** mills describe the market as "orderly with deliveries good."

**Plate**—Sheared mill plate at **East Coast** mills is just about spoken for in the second quarter. Some mills have closed up books. Others—operating with a forty-five day limit on order entry—will open June books soon. In most cases, however, the tonnage has already been earmarked for regular customers. Extra plate tonnage made available to one mill when its linepipe mill shut down was quickly sold.

**Pipe and Tubing** — Inventory build-up of oil country seamless may be less than supposed. New orders are coming in for specific lots—i.e., 32 tons, 51 tons, etc. This probably means the steel is ordered for specific jobs, the mills say. They also point out that last year, during inventory reduction, the oil companies were using about twice as much pipe as they bought. On that basis, shipments could now double without increasing inventories.

Standard pipe sales are improving and some mills are planning production boosts. Linepipe sales have benefited from strike worry, but the long-range prospect is also encouraging mills. (See story on p. 58.)

**Wire Products**—Wire mills are nearing capacity operations for the first time since the 1955-1956 period. Manufacturers' wire ordering is heavy, mainly from auto companies and their suppliers. Farm distributors are ordering merchant wire in excess of their needs.

**Stainless Strip** — Seymour Mfg. Co., Seymour, Conn., is now producing stainless steel strip in gages down to .001, in types 301, 302, 304, 305, 316, 321, and 430. Maximum widths are 17¾ in. in gages down to .005 and 7 in. in gages .005 to .001. The material may be slit to as little as ¼ in. wide in gages up to .020, and to a minimum of 1 in. wide in heavier stock.

---

**PURCHASING AGENT'S CHECKLIST**

How long before a steel strike would pinch industry? An IRON AGE survey on steel inventories. P. 53

Why orders for linepipe are improving P. 58

The right way to purchase special purpose machines. P. 100

# COMPARISON OF PRICES

*(Effective April 7, 1959)*

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

| | Apr. 7 1959 | Mar. 31 1959 | Mar. 10 1959 | Apr. 8 1958 |
|---|---|---|---|---|
| **Flat-Rolled Steel:** (per pound) | | | | |
| Hot-rolled sheets | 5.10¢ | 5.10¢ | 5.10¢ | 4.925¢ |
| Cold-rolled sheets | 6.275 | 6.275 | 6.275 | 6.05 |
| Galvanized sheets (10 ga.) | 6.875 | 6.875 | 6.875 | 6.60 |
| Hot-rolled strip | 5.10 | 5.10 | 5.10 | 4.925 |
| Cold-rolled strip | 7.425 | 7.425 | 7.425 | 7.17 |
| Plate | 5.30 | 5.30 | 5.30 | 5.12 |
| Plates, wrought iron | 13.55 | 13.55 | 13.55 | 13.15 |
| Stainl's C-R strip (No. 302) | 52.00 | 52.00 | 52.00 | 52.00 |
| **Tin and Terneplate:** (per base box) | | | | |
| Tinplate (1.50 lb.) cokes | $10.65 | $10.65 | $10.65 | $10.30 |
| Tin plates, electro (0.50 lb.) | 9.35 | 9.35 | 9.35 | 9.00 |
| Special coated mfg. ternes | 9.90 | 9.90 | 9.90 | 9.55 |
| **Bars and Shapes:** (per pound) | | | | |
| Merchant bar | 5.675¢ | 6.675¢ | 5.675¢ | 5.425¢ |
| Cold finished bar | 7.65 | 7.65 | 7.65 | 7.30 |
| Alloy bars | 6.725 | 6.725 | 6.725 | 6.475 |
| Structural shapes | 5.50 | 5.50 | 5.50 | 5.275 |
| Stainless bars (No. 302) | 46.75 | 46.75 | 45.00 | 45.00 |
| Wrought iron bars | 14.90 | 14.90 | 14.90 | 14.45 |
| **Wire:** (per pound) | | | | |
| Bright wire | 8.00¢ | 8.00¢ | 8.00¢ | 7.65¢ |
| **Rails:** (per 100 lb.) | | | | |
| Heavy rails | $5.75 | $5.75 | $5.75 | $5.525 |
| Light rails | 6.725 | 6.725 | 6.725 | 6.50 |
| **Semifinished Steel:** (per net ton) | | | | |
| Rerolling billets | $80.00 | $80.00 | $80.00 | $77.50 |
| Slabs, rerolling | 80.00 | 80.00 | 80.00 | 77.50 |
| Forging billets | 99.50 | 99.50 | 99.50 | 96.00 |
| Alloy blooms, billets, slabs | 119.00 | 119.00 | 119.00 | 114.00 |
| **Wire Rods and Skelp:** (per pound) | | | | |
| Wire rods | 6.40¢ | 6.40¢ | 6.40¢ | 6.15¢ |
| Skelp | 5.05 | 5.05 | 5.05 | 4.875 |
| **Finished Steel Composite:** (per pound) | | | | |
| Base price | 6.196¢ | 6.196¢ | 6.196¢ | 5.967¢ |

| | Apr. 7 1959 | Mar. 31 1959 | Mar. 10 1959 | Apr. 8 1958 |
|---|---|---|---|---|
| **Pig Iron:** (per gross ton) | | | | |
| Foundry, del'd Phila. | $70.57 | $70.57 | $70.57 | $70.97 |
| Foundry, Southern Cin'ti | 73.87 | 73.87 | 73.87 | 73.87 |
| Foundry, Birmingham | 62.50 | 62.50 | 62.50 | 62.50 |
| Foundry, Chicago | 66.50 | 66.50 | 66.50 | 66.50 |
| Basic, del'd Philadelphia | 70.07 | 70.07 | 70.07 | 70.47 |
| Basic, Valley furnace | 66.00 | 66.00 | 66.00 | 66.00 |
| Malleable, Chicago | 66.50 | 66.50 | 66.50 | 66.50 |
| Malleable, Valley | 66.50 | 66.50 | 66.50 | 66.50 |
| Ferromanganese, 74-76 pct Mn, cents per lb‡ | 12.25 | 12.25 | 12.25 | 12.25 |
| **Pig Iron Composite:** (per gross ton) | | | | |
| Pig iron | $66.41 | $66.41 | $66.41 | $66.49 |
| **Scrap:** (per gross ton) | | | | |
| No. 1 steel, Pittsburgh | *$39.50* | $41.50 | $44.50 | $33.50 |
| No. 1 steel, Phila. area | *34.50* | 35.50 | 37.50 | 37.50 |
| No. 1 steel, Chicago | *35.50* | 36.50 | 41.50 | 29.50 |
| No. 1 bundles, Detroit | 32.50 | 32.50 | 37.50 | 22.50 |
| Low phos., Youngstown | *41.50* | 43.50 | 47.50 | 33.00 |
| No. 1 mach'y cast, Pittsburgh | 49.50 | 49.50 | 51.50 | 49.50 |
| No. 1 mach'y cast, Phila. | 49.50 | 49.50 | 49.50 | 49.50 |
| No. 1 mach'y cast, Chicago | 54.50 | 54.50 | 56.50 | 44.50 |
| **Steel Scrap Composite:** (per gross ton) | | | | |
| No. 1 hvy. melting scrap | *$36.50* | $37.83 | $41.17 | $33.50 |
| No. 2 bundles | *24.17* | 25.83 | 29.00 | 24.83 |
| **Coke, Connellsville:** (per net ton at oven) | | | | |
| Furnace coke, prompt | $14.50-15.50 | $14.50-15.50 | $14.50-15.50 | $15.38 |
| Foundry coke, prompt | 18.50 | 18.50 | 18.50 | 17.50-19 |
| **Nonferrous Metals:** (cents per pound to large buyers) | | | | |
| Copper, electrolytic, Conn. | 31.50 | 31.50 | 31.50 | 25.00 |
| Copper, Lake, Conn. | 31.50 | 31.50 | 31.50 | 25.00 |
| Tin, Straits, N. Y. | 103.00† | 102.375* | 102.00 | 92.00 |
| Zinc, East St. Louis | 11.00 | 11.00 | 11.00 | 10.00 |
| Lead, St. Louis | *10.80* | 11.30 | 11.30 | 11.80 |
| Aluminum, virgin ingot | 26.80 | 26.80 | 26.80 | 26.10 |
| Nickel, electrolytic | 74.00 | 74.00 | 74.00 | 74.00 |
| Magnesium, ingot | 36.00 | 36.00 | 36.00 | 36.00 |
| Antimony, Laredo, Tex. | 29.50 | 29.50 | 29.50 | 29.50 |

† Tentative. ‡ Average. * Revised.

**Finished Steel Composite**

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

**Pig Iron Composite**

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

**Steel Scrap Composites**

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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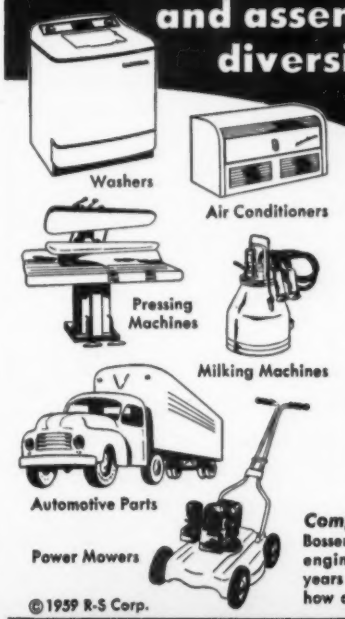


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# Have Scrap Prices Hit Bottom?

**Mills in some areas have shown a spark of interest in dealer scrap.**

**It may mean that primary heavy-melting prices are near the mill cost of hot metal.**

▪ Scrap prices may be nearing the bottom of the downtrend, if they haven't already hit it.

Mills in Pittsburgh and Cleveland, at least, have shown new interest in buying as openhearth scrap in those districts dropped from $1 to $3 a ton. Industrial lists are being snapped up. Distress tonnages are moving with little trouble.

This revival in mill interest indicates that the price of scrap is in the vicinity of the mill cost of hot metal. The major question now is how long the mills can get along on their present scrap inventories.

The mill operating rate is in the mid-90's and is likely to continue at that rate until the end of June. With the price of scrap at a level that is attractive to the mills, it is possible that new purchases may be in the offing.

The IRON AGE No. 1 heavy melting Composite Price dropped $1.33 to $36.50 based on a $2 drop in Pittsburgh and $1 in Philadelphia and Chicago.

**Pittsburgh** — Prices of dealer openhearth grades dropped $1 to $2 here, sinking to what may be the turning point. The price slide has been accompanied by widespread mill buying. This month's industrial lists were quickly soaked up. Distress scrap has been pulled out of yards. The action has left dealers in a position to resist prices that do not permit replacement. It puts scrap at prices that are attractive to mills.

**Chicago**—Factory bundles moved at $43 early last week when one mill bought the bundle list of a major scrap producer. But early this week, material was moving again at $41. No. 1 and No. 2 heavy melting are down $1 on token mill purchases. No. 2 heavy melting is off $2 and No. 2 bundles slid $3. Railroad grades are down $1 as are turnings. Only cast and stainless continue to hold fairly well.

**Philadelphia**—Openhearth scrap prices dropped $1 based on small purchase of No. 1 heavy melting for $35 by one mill. No one foresees any large mill orders in the near future. Turnings prices are down $1-$2 on light broker buying. An upriver foundry paid $41 for cupola cast, but another is holding out for $1 lower. Export is light.

**New York**—No. 2 heavy melting and No. 2 bundles have fallen $1 a ton while most turnings grades are off $2 in face of lack of orders and plentiful supply. Some export business and a trickle of local orders is so far propping up No. 1 heavy melting.

**Detroit**—Scrap is plentiful, but customers are few and far between. Brokers and dealers are referring to scattered purchases as "patchwork buying." They foresee no improvement before late summer. Many say this month's price break caught them by surprise. They didn't expect it for another 30-45 days.

**Cleveland** — Another $3 drop last week has at least served to get mills interested in buying scrap. So there is a chance the market has bottomed out. Most orders can still be filled from industrial lists and railroad scrap.

**St. Louis**—Scrap is still hard to sell in this area. Dealer offers were being turned down by mills because their inventories are heavy. No. 1 heavy melting, turnings, cast iron borings, and railroad specialties are down $1.

**Birmingham** — A large electric furnace mill that is usually the price setter in this district returned to the market this week with orders at $1 to $4 a ton under its last purchase. Openhearth consumers are still out of the market. Cast is holding steady on limited orders.

**Cincinnati** — Dealers are faring better here than elsewhere. They can get orders to ship normal-size tonnages to local mills, although broker buying price slipped another 50¢. No. 2 heavy melting dropped $3.

**Buffalo**—Market continues weak with only cast iron showing any strength. Dealers are shipping against old orders and see no new sales in sight for at least the rest of this month. Prices are unchanged.

**Boston** — This market is very quiet. Openhearth scrap prices are down $2 and turnings down $1. Dealer morale is low.

**West Coast** — No. 2 bundles dropped $3 in Los Angeles. No. 2 heavy melting slid $1 in San Francisco. Only export continues to hold up this market, as mills continue to rely on their inventories.

**Houston**—Most prices are holding steady, although they are weakening now that the district mill is out of the market. Also, out-of-district scrap is being offered in this district. Brokers are discouraged about the future.

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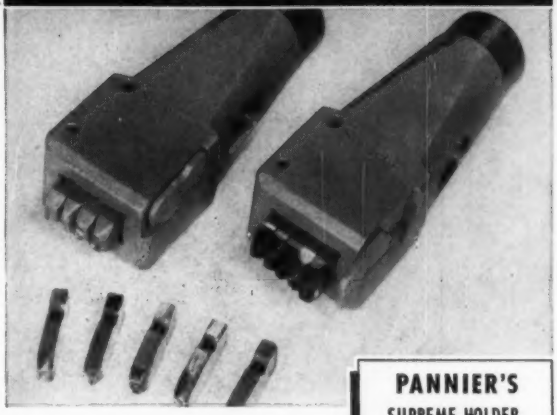

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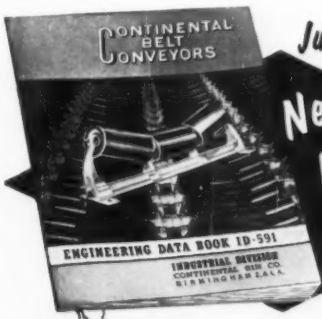


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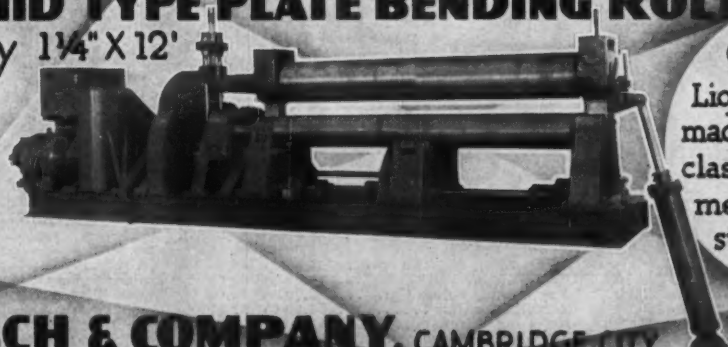

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# SCRAP PRICES *(Effective April 7, 1959)*

## Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

### Pittsburgh

| | |
|---|---|
| No. 1 hvy. melting | $39.00 to $40.00 |
| No. 2 hvy. melting | 30.00 to 31.00 |
| No. 1 dealer bundles | 41.00 to 42.00 |
| No. 1 factory bundles | 45.00 to 46.00 |
| No. 2 bundles | 27.00 to 28.00 |
| No. 1 busheling | 41.00 to 42.00 |
| Machine shop turn. | 21.00 to 22.00 |
| Shoveling turnings | 27.00 to 28.00 |
| Cast iron borings | 27.00 to 28.00 |
| Low phos. punch'gs plate | 45.00 to 46.00 |
| Heavy turnings | 31.00 to 32.00 |
| No. 1 RR hvy. melting | 41.00 to 42.00 |
| Scrap rails, random lgth. | 52.00 to 53.00 |
| Rails 2 ft and under | 55.00 to 56.00 |
| RR specialties | 46.00 to 47.00 |
| No. 1 machinery cast. | 49.00 to 50.00 |
| Cupola cast. | 45.00 to 46.00 |
| Heavy breakable cast. | 43.00 to 44.00 |
| Stainless | |
| 18-8 bundles and solids | 230.00 to 235.00 |
| 18-8 turnings | 120.00 to 125.00 |
| 430 bundles and solids | 130.00 to 135.00 |
| 410 turnings | 55.00 to 60.00 |

### Chicago

| | |
|---|---|
| No. 1 hvy. melting | $35.00 to $36.00 |
| No. 2 hvy. melting | 31.00 to 32.00 |
| No. 1 dealer bundles | 35.00 to 36.00 |
| No. 1 factory bundles | 40.00 to 41.00 |
| No. 2 bundles | 22.00 to 23.00 |
| No. 1 busheling | 35.00 to 36.00 |
| Machine shop turn. | 17.00 to 18.00 |
| Mixed bor. and turn. | 19.00 to 20.00 |
| Shoveling turnings | 19.00 to 20.00 |
| Cast iron borings | 19.00 to 20.00 |
| Low phos. forge crops | 47.00 to 48.00 |
| Low phos. punch'gs plate, ½ in. and heavier | 45.00 to 46.00 |
| Low phos. 2 ft and under | 43.00 to 44.00 |
| No. 1 RR hvy. melting | 41.00 to 42.00 |
| Scrap rails, random lgth. | 47.00 to 48.00 |
| Rerolling rails | 59.00 to 60.00 |
| Rails 2 ft and under | 55.00 to 56.00 |
| Angles and splice bars | 50.00 to 51.00 |
| RR steel car axles | 67.00 to 68.00 |
| RR couplers and knuckles | 48.00 to 49.00 |
| No. 1 machinery cast. | 54.00 to 55.00 |
| Cupola cast | 47.00 to 48.00 |
| Cast iron wheels | 41.00 to 42.00 |
| Malleable | 55.00 to 56.00 |
| Stove plate | 44.00 to 45.00 |
| Steel car wheels | 46.00 to 47.00 |
| Stainless | |
| 18-8 bundles and solids | 220.00 to 225.00 |
| 18-8 turnings | 120.00 to 125.00 |
| 430 bundles and solids | 115.00 to 120.00 |
| 430 turnings | 55.00 to 60.00 |

### Philadelphia Area

| | |
|---|---|
| No. 1 hvy. melting | $34.00 to $35.00 |
| No. 2 hvy. melting | 28.00 to 29.00 |
| No. 1 dealer bundles | 37.00 to 38.00 |
| No. 2 bundles | 22.00 to 23.00 |
| No. 1 busheling | 35.00 to 36.00 |
| Machine shop turn. | 18.00 to 20.00 |
| Mixed bor. short turn. | 18.00 to 20.00 |
| Cast iron borings | 18.00 to 20.00 |
| Shoveling turnings | 23.00 to 24.00 |
| Clean cast. chem. borings | 30.00 to 31.00 |
| Low phos. 5 ft and under | 40.00 to 41.00 |
| Low phos. 2 ft punch'gs | 42.00 to 43.00 |
| Elec. furnace bundles | 39.00 to 40.00 |
| Heavy turnings | 33.00 to 34.00 |
| RR specialties | 42.00 to 43.00 |
| Rails 18 in. and under | 58.00 to 60.00 |
| Cupola cast. | 40.00 to 41.00 |
| Heavy breakable cast. | 42.00 to 43.00 |
| Cast iron car wheels | 44.00 to 45.00 |
| Malleable | 67.00 to 68.00 |
| No. 1 machinery cast. | 49.00 to 50.00 |

### Cincinnati

**Brokers buying prices per gross ton on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $34.00 to $35.00 |
| No. 2 hvy. melting | 27.50 to 28.50 |
| No. 1 dealer bundles | 34.00 to 35.00 |
| No. 2 bundles | 21.00 to 22.00 |
| Machine shop turn. | 15.00 to 16.00 |
| Shoveling turnings | 18.00 to 19.00 |
| Cast iron borings | 17.00 to 18.00 |
| Low phos. 18 in. and under | 41.00 to 42.00 |
| Rails, random length | 47.00 to 48.00 |
| Rails, 18 in. and under | 54.00 to 55.00 |
| No. 1 cupola cast. | 43.00 to 44.00 |
| Hvy. breakable cast. | 40.00 to 41.00 |
| Drop broken cast. | 48.00 to 49.00 |

### Youngstown

| | |
|---|---|
| No. 1 hvy. melting | $39.00 to $40.00 |
| No. 2 hvy. melting | 32.00 to 33.00 |
| No. 1 dealer bundles | 39.00 to 40.00 |
| No. 2 bundles | 26.00 to 27.00 |
| Machine shop turn. | 22.00 to 23.00 |
| Shoveling turnings | 22.00 to 23.00 |
| Low phos. plate | 41.00 to 42.00 |

### Cleveland

| | |
|---|---|
| No. 1 hvy. melting | $35.50 to $36.50 |
| No. 2 hvy. melting | 29.50 to 30.50 |
| No. 1 dealer bundles | 35.50 to 36.50 |
| No. 1 factory bundles | 41.00 to 42.00 |
| No. 2 bundles | 22.50 to 23.50 |
| No. 1 busheling | 35.50 to 36.50 |
| Machine shop turn. | 16.00 to 17.00 |
| Mixed bor. and turn. | 21.00 to 22.00 |
| Shoveling turnings | 21.00 to 22.00 |
| Cast iron borings | 21.00 to 22.00 |
| Cut structural & plates, 2 ft & under | 42.00 to 43.00 |
| Drop forge flashings | 35.50 to 36.50 |
| Low phos. punch'gs plate | 36.50 to 37.50 |
| Foundry steel, 2 ft & under | 37.00 to 38.00 |
| No. 1 RR hvy. melting | 39.00 to 40.00 |
| Rails 2 ft and under | 56.00 to 57.00 |
| Rails 18 in. and under | 57.00 to 58.00 |
| Steel axle turnings | 24.00 to 25.00 |
| Railroad cast | 53.00 to 54.00 |
| No. 1 machinery cast | 51.00 to 52.00 |
| Stove plate | 48.00 to 49.00 |
| Malleable | 66.00 to 67.00 |
| Stainless | |
| 18-8 bundles | 210.00 to 220.00 |
| 18-8 turnings | 115.00 to 120.00 |
| 430 bundles | 120.00 to 125.00 |

### Buffalo

| | |
|---|---|
| No. 1 hvy. melting | $34.00 to $35.00 |
| No. 2 hvy. melting | 29.00 to 30.00 |
| No. 1 busheling | 34.00 to 35.00 |
| No. 1 dealer bundles | 34.00 to 35.00 |
| No. 2 bundles | 24.00 to 25.00 |
| Machine shop turn. | 17.00 to 18.00 |
| Mixed bor. and turn. | 19.00 to 20.00 |
| Shoveling turnings | 21.00 to 22.00 |
| Cast iron borings | 19.00 to 20.00 |
| Low phos. plate | 39.00 to 40.00 |
| Structurals and plate 2 ft and under | 43.00 to 44.00 |
| Scrap rails, random lgth. | 41.00 to 42.00 |
| Rails 2 ft and under | 51.00 to 52.00 |
| No. 1 machinery cast. | 51.00 to 52.00 |
| No. 1 cupola cast. | 47.00 to 48.00 |

### St. Louis

| | |
|---|---|
| No. 1 hvy. melting | $35.00 to $36.00 |
| No. 2 hvy. melting | 33.00 to 34.00 |
| No. 1 dealer bundles | 38.00 to 39.00 |
| No. 2 bundles | 26.00 to 27.00 |
| Machine shop turn. | 15.00 to 16.00 |
| Shoveling turnings | 17.00 to 18.00 |
| Cast iron borings | 20.00 to 21.00 |
| No. 1 RR hvy. melting | 39.00 to 40.00 |
| Rails, random lengths | 47.00 to 48.00 |
| Rails, 18 in. and under | 52.00 to 53.00 |
| Angles and splice bars | 47.00 to 48.00 |
| RR specialties | 44.00 to 45.00 |
| Cupola cast | 49.00 to 50.00 |
| Heavy breakable cast. | 40.00 to 41.00 |
| Cast iron brake shoes | 37.00 to 38.00 |
| Stove plate | 44.50 to 45.50 |
| Cast iron car wheels | 42.00 to 43.00 |
| Rerolling rails | 58.00 to 59.00 |
| Unstripped motor blocks | 41.00 to 42.00 |

### Birmingham

| | |
|---|---|
| No. 1 hvy. melting | $32.00 to $33.00 |
| No. 2 hvy. melting | 28.00 to 29.00 |
| No. 1 dealer bundles | 33.00 to 34.00 |
| No. 2 bundles | 21.00 to 22.00 |
| No. 1 busheling | 33.00 to 34.00 |
| Machine shop turn. | 23.00 to 24.00 |
| Shoveling turnings | 24.00 to 25.00 |
| Cast iron borings | 14.00 to 15.00 |
| Electric furnace bundles | 36.00 to 37.00 |
| Elec. furnace, 3 ft & under | 33.00 to 34.00 |
| Bar crops and plate | 40.00 to 41.00 |
| Structural and plate, 2 ft. | 39.00 to 40.00 |
| No. 1 RR hvy. melting | 37.00 to 38.00 |
| Scrap rails, random lgth. | 41.00 to 42.00 |
| Rails, 18 in. and under | 49.00 to 50.00 |
| Angles and splice bars | 42.00 to 43.00 |
| Rerolling rails | 51.00 to 52.00 |
| No. 1 cupola cast. | 53.00 to 54.00 |
| Stove plate | 53.00 to 54.00 |
| Cast iron car wheels | 40.00 to 41.00 |
| Unstripped motor blocks | 40.00 to 41.00 |

### New York

**Brokers buying prices per gross ton on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $27.00 to $28.00 |
| No. 2 hvy. melting | 23.00 to 24.00 |
| No. 2 dealer bundles | 17.00 to 18.00 |
| Machine shop turnings | 10.00 to 11.00 |
| Mixed bor. and turn. | 13.00 to 14.00 |
| Shoveling turnings | 15.00 to 16.00 |
| Clean chem. cast. borings | 23.00 to 25.00 |
| No. 1 machinery cast. | 37.00 to 38.00 |
| Mixed yard cast. | 35.00 to 36.00 |
| Heavy breakable cast. | 33.00 to 34.00 |
| Stainless | |
| 18-8 prepared solids | 195.00 to 200.00 |
| 18-8 turnings | 85.00 to 90.00 |
| 430 prepared solids | 85.00 to 90.00 |
| 430 turnings | 20.00 to 25.00 |

### Detroit

**Brokers buying prices per gross ton on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $30.00 to $31.00 |
| No. 2 hvy. melting | 21.00 to 22.00 |
| No. 1 dealer bundles | 32.00 to 33.00 |
| No. 2 bundles | 17.00 to 18.00 |
| No. 1 busheling | 30.00 to 31.00 |
| Drop forge flashings | 29.00 to 30.00 |
| Machine shop turn. | 12.00 to 13.00 |
| Mixed bor. and turn. | 14.00 to 15.00 |
| Shoveling turnings | 14.00 to 15.00 |
| Cast iron borings | 14.00 to 15.00 |
| Heavy breakable cast. | 32.00 to 33.00 |
| Mixed cupola cast. | 41.00 to 42.00 |
| Automotive cast. | 47.00 to 48.00 |
| Stainless | |
| 18-8 bundles and solids | 210.00 to 215.00 |
| 18-8 turnings | 100.00 to 105.00 |
| 430 bundles and solids | 100.00 to 105.00 |

### Boston

**Brokers buying prices per gross ton on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $24.00 to $25.00 |
| No. 2 hvy. melting | 20.00 to 21.00 |
| No. 1 dealer bundles | 24.00 to 25.00 |
| No. 2 bundles | 17.00 to 18.00 |
| No. 1 busheling | 24.00 to 25.00 |
| Machine shop turn. | 9.00 to 10.00 |
| Shoveling turnings | 12.00 to 13.00 |
| Clean cast. chem. borings | 18.00 to 19.00 |
| No. 1 machinery cast. | 33.00 to 34.00 |
| Mixed cupola cast. | 33.00 to 34.00 |
| Heavy breakable cast. | 31.00 to 32.00 |
| Stove plate | 29.00 to 30.00 |

### San Francisco

| | | |
|---|---|---|
| No. 1 hvy. melting | .... | $36.00 |
| No. 2 hvy. melting | .... | 33.00 |
| No. 1 dealer bundles | $32.00 to | 34.00 |
| No. 2 bundles | .... | 22.00 |
| Machine shop turn. | .... | 17.00 |
| Cast iron borings | .... | 17.00 |
| No. 1 cupola cast. | .... | 45.00 |

### Los Angeles

| | | |
|---|---|---|
| No. 1 hvy melting | .... | $38.00 |
| No. 2 hvy. melting | .... | 36.00 |
| No. 1 dealer bundles | .... | 35.00 |
| No. 2 bundles | .... | 18.00 |
| Machine shop turn. | $16.00 to | 17.00 |
| Shoveling turnings | 18.00 to | 19.00 |
| Cast iron borings | 18.00 to | 19.00 |
| Elec. furn. 1 ft and under (foundry) | .... | 49.00 |
| No. 1 cupola cast. | .... | 45.00 |

### Seattle

| | | |
|---|---|---|
| No. 1 hvy. melting | .... | $35.00 |
| No. 2 hvy. melting | .... | 33.00 |
| No. 2 bundles | .... | 22.00 |
| No. 1 cupola cast. | .... | 36.00 |
| Mixed yard cast. | .... | 36.00 |

### Hamilton, Ont.

**Brokers buying prices per gross ton on cars:**

| | | |
|---|---|---|
| No. 1 hvy. melting | .... | $32.25 |
| No. 2 hvy. melting | .... | 28.25 |
| No. 1 dealer bundles | .... | 32.25 |
| No. 2 bundles | .... | 22.75 |
| Mixed steel scrap | .... | 24.25 |
| Bush., new fact., prep'd | .... | 32.25 |
| Bush., new fact., unprep'd | .... | 26.25 |
| Machine shop turn. | .... | 14.00 |
| Short steel turn. | .... | 17.00 |
| Mixed bor. and turn. | .... | 13.00 |
| Rails, rerolling | .... | 37.00 |
| Cast scrap | $46.50 to | 48.00 |

### Houston

**Brokers buying prices per gross ton on cars:**

| | | |
|---|---|---|
| No. 1 hvy. melting | .... | $36.00 |
| No. 2 hvy. melting | .... | 33.00 |
| No. 2 bundles | .... | 23.00 |
| Machine shop turn. | .... | 16.00 |
| Shoveling turnings | .... | 20.00 |
| Cut structural plate 2 ft & under | $44.50 to | $45.50 |
| Unstripped motor blocks | 38.00 to | 39.00 |
| Cupola cast. | 45.00 to | 46.00 |
| Heavy breakable cast. | 27.00 to | 28.00 |

*Mechanized scrap shear now available in capacities of*

# 350, 750 AND 900 TONS

One of these new shear capacities should be right for your operation. If so, you can get increased output with economy of operation through mechanized preparation of scrap. A Farrel Watson-Stillman shear can cut your labor cost by as much as 75%, as only three men are needed for the job—one to run the shear, another to operate a crane and a third to watch for derelict material in loading.

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WS-59

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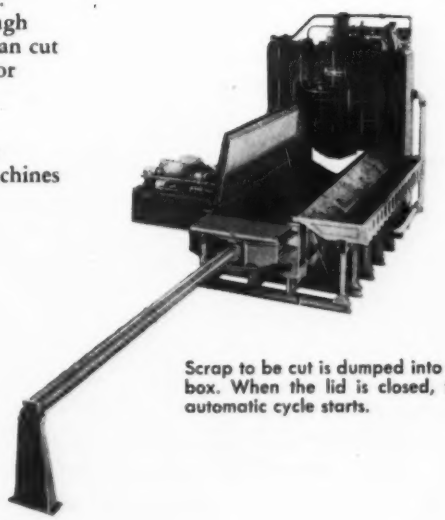


Scrap to be cut is dumped into charging box. When the lid is closed, the semi-automatic cycle starts.

# Koenig Predicts Copper Future

**The Cerro de Pasco president sees Free World demand over 5 million tons by 1965.**

**He offers several solid reasons for his optimism.**

▪ No matter how he cuts the deck, the future for copper keeps coming up the same for Robert P. Koenig, president of Cerro de Pasco, copper miner, smelter and seller. It's aces.

**Mr. Koenig calculates, for instance, that the Free World will demand about 5.1 million short tons of copper in 1965. In 1957, a good year, it was 3.5 million tons.**

**Production Problems**—Projecting planned new facilities, Free World mining capacity would only be about 4.6 million tons by 1965. This, of course, would make it a sellers' market.

**But a price stabilized at about 35¢ to 37¢ per lb would probably bring out the additional metal, Mr. Koenig believes.**

Reserves, pegged by a recent International Geological Congress, are about 190 million tons, enough for 48 years at the current rate of consumption, or 38 years at the predicted rate. But the higher prices might bring some lower grade ore, not now considered reserve, into the picture.

**Substitutes No Headache** — As for the inroads of substitutes into copper markets, Mr. Koenig says, "Let us remember that copper has been in use, in one form or another, for almost 10,000 years, and is therefore not likely to be replaced by some Johnny-come-lately, however flashy."

Here are some of the indicators that lead Mr. Koenig to his prediction on increased demand.

**More People**—A solid yardstick is population. More people mean a bigger potential market. The Cerro president initially figured on a population growth of about 25 million annually, to about 3.25 billion people in the world by 2000 AD. But United Nations studies indicate this total will now likely be reached in 1967. The population growth in 1957 and 1958 was about 45 million people per year.

Another rosy road marker: Per capita consumption. The average U. S. citizen uses about 18 lb of virgin copper each year. But the average for the world, including the U. S., is 2 3/4 lb annually.

**Using More per Person**—If the population rises as predicted, and per capita consumption in the world rises to only one-quarter of what it is in the U. S., demand for copper in 1965 would be in the neighborhood of 8.4 million tons.

The forecast for electrical power in the next few decades is music to the ears of coppermen. Mr. Koenig points out about half of the Free World's copper consumption is by electrical and power industries.

**More Power**—The record shows the leaders, U. S. and Great Britain, doubled their electrical use every decade in the first half of this century. Consensus reported by Mr. Koenig is that in the two decades from 1955 to 1975 electrical consumption in this country will increase about 280 pct.

Mr. Koenig quotes "one electrical industry spokesman" that electric energy requirements in the U. S. might well reach three trillion kilowatts by 1963. In 1957 it was 630 billion kilowatts.

**Old World Demand**—Europe is likely to carry its weight. "It would appear, therefore, that despite the high degree of post-war industrial recovery abroad, some expansion is still possible for European copper-consuming industries, particularly if they are to recoup their pre-war position vis-a-vis the United States."

And the progress of their metal in the underdeveloped countries is also likely to warm coppermen's hearts. "The comparison of copper consumption on a regional basis over the 20-year period from 1938 through 1957 shows the underdeveloped areas of the world have almost quadrupled their consumption of copper. . . ."

There is "every indication that this trend will continue to gather momentum," believes Mr. Koenig.

Without even allowing for increase in the economy, an extension of the historical consumption of copper would put it at about 4.6 million tons in the Free World by 1965, figures the Cerro president.

## Aluminum

To be precise, you just can't talk about aluminum markets generally anymore. While demand for primary metal and many wrought products is moving into the area where producers are pondering the possibilities of a higher price when the freeze comes off, the extrusions business is still very soft.

The word heard most in the trade is discounting. It's hard to pin down the real price. This is likely about 5¢ to 10¢ per lb below list depending on alloy, shape, and market area.

One thing is sure. No one is paying list for soft extrusions.

## Copper

It looks like the industry is running true to form.

Copper producers have always

been plagued by local labor problems and work stoppages because of the unusually large number of unions representing the workers.

In 1957 without a major strike, the world industry lost 90,000 tons of production this way. When they add things up this year, it may come close, even if Mine, Mill agrees to a new contract without any lost time.

The injunction against the workers at Anaconda's Butte, Mont., operations is up, and some observers look for trouble.

There is unrest in Chile. There was a short work stoppage at Kennecott's Chino, N. M., operations. And even the Japanese industry is struck.

African sources are in the midst of a social revolution so strikes occur almost regularly.

Tin prices for the week: April 1 —102.625; April 2 — 102.875; April 3 — 102.75; April 6 — 102.875; April 7—103.00.*

* Estimate

## Monthly Average Metal Prices

(Cents per lb except as noted)

Average prices of the major nonferrous metals in March based on quotations appearing in THE IRON AGE, were as follows:

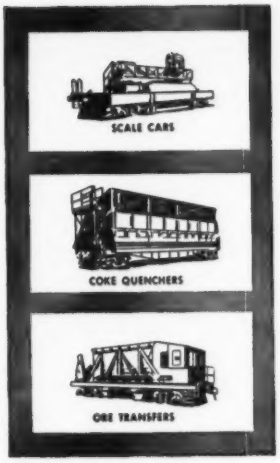
| | |
|---|---|
| Electrolytic copper, del'd Conn. Valley | 31.14 |
| Copper, Lake | 31.14 |
| Straits Tin, New York | 103.03 |
| Zinc, E. St. Louis | 11.00 |
| Lead, St. Louis | 11.30 |
| Aluminum ingot | 26.80 |

Note: Quotations are on going prices

## Primary Prices

| (cents per lb) | current price | last price | date of change |
|---|---|---|---|
| Aluminum pig | 24.70 | 24.00 | 8/1/58 |
| Aluminum ingot | 26.80 | 26.10 | 8/1/58 |
| Copper (E) | 31.50 | 30.00 | 3/9/59 |
| Copper (CS) | 34.00 | 32.00 | 3/16/59 |
| Copper (L) | 31.50 | 30.00 | 3/9/59 |
| Lead, St. L. | 10.80 | 11.30 | 4/1/59 |
| Lead, N. Y. | 11.00 | 11.50 | 4/1/59 |
| Magnesium ingot | 36.00 | 34.00 | 8/13/58 |
| Magnesium pig | 35.25 | 33.75 | 8/13/58 |
| Nickel | 74.00 | 64.50 | 12/8/58 |
| Titanium sponge | 162-182 | 165-206 | 11/3/58 |
| Zinc, E. St. L. | 11.00 | 11.50 | 2/23/59 |
| Zinc, N. Y. | 11.50 | 12.00 | 2/23/59 |

ALUMINUM: 99% ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colbourne, Canada. ZINC: prime western. Tin: See above; Other primary prices, pg. 148.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## MILL PRODUCTS

*(Cents per lb unless otherwise noted)*

### ALUMINUM

*(Base 30,000 lb, f.o.b. ship pt., frt. allowed)*

**Flat Sheet (Mill Finish and Plate)**

*("F" temper except 6061-0)*

| Alloy | .032 | .081 | .136 .249 | .250- 3. |
|---|---|---|---|---|
| 1100, 3003 | 45.7 | 43.8 | 42.8 | 43.3 |
| 5052 | 53.1 | 48.4 | 46.9 | 46.0 |
| 6061-0 | 50.1 | 45.7 | 43.9 | 44.9 |

**Extruded Solid Shapes**

| Factor | 6063 T-5 | 6062 T-6 |
|---|---|---|
| 6- 8 | 42.7-44.2 | 51.1-54.8 |
| 12-14 | 42.7-44.2 | 52.0-56.5 |
| 24-26 | 43.2-44.7 | 62.8-67.5 |
| 36-38 | 46.7-49.2 | 86.9-90.5 |

**Screw Machine Stock—2011-T-3**

| Size" | ¼ | ⅜-⅝ | ¾-1 | 1¼-1½ |
|---|---|---|---|---|
| Price | 62.0 | 61.2 | 59.7 | 57.3 |

**Roofing Sheet, Corrugated**

(Per sheet, 26" wide base, 16,000 lb)

| Length"→ | 72 | 96 | 120 | 144 |
|---|---|---|---|---|
| .019 gage | $1.411 | $1.884 | $2.353 | $2.823 |
| .024 gage | 1.762 | 2.349 | 2.937 | 3.524 |

### MAGNESIUM

*(F.o.b. shipping Pt., carload frt. allowed)*

**Sheet and Plate**

| Type→ Gage→ | .250 3.00 | .250- 2.00 | .188 | .081 | .032 |
|---|---|---|---|---|---|
| AZ31B Stand. Grade | ..... | 67.9 | 69.0 | 77.9 | 108.1 |
| AZ31B Spec. | ..... | 93.3 | 95.7 | 108.7 | 171.3 |
| Tread Plate | ..... | 70.6 | 71.7 | ..... | ..... |
| Tooling Plate | 73.0 | ..... | ..... | ..... | ..... |

**Extruded Shapes**

| factor→ | 6-8 | 12-14 | 24-26 | 36-38 |
|---|---|---|---|---|
| Comm. Grade (AZ31C) | 69.6 | 70.7 | 75.6 | 89.2 |
| Spec. Grade (AZ31B) | 84.6 | 85.7 | 90.6 | 104.2 |

**Alloy Ingot**

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

### NICKEL, MONEL, INCONEL

*(Base prices f.o.b. mill)*

| | "A" Nickel | Monel | Inconel |
|---|---|---|---|
| Sheet, CR | 126 | 106 | 128 |
| Strip, CR | 124 | 108 | 138 |
| Rod, bar, HR | 107 | 89 | 109 |
| Angles, HR | 107 | 89 | 109 |
| Plates, HR | 120 | 105 | 121 |
| Seamless tube | 157 | 129 | 200 |
| Shot, blocks | ... | 87 | ... |

### COPPER, BRASS, BRONZE

*(Freight included in 5000 lbs)*

| | Sheet | Wire | Rod | Tube |
|---|---|---|---|---|
| Copper | 55.63 | ..... | 52.86 | 55.82 |
| Brass, Yellow | 48.24 | 48.75 | 48.18 | 51.05 |
| Brass, Low | 51.23 | 51.77 | 51.17 | 54.54 |
| Brass, R L | 52.29 | 52.83 | 52.23 | 55.60 |
| Brass, Naval | 52.80 | ..... | 46.61 | 56.21 |
| Munts Metal | 50.85 | ..... | 46.16 | ..... |
| Comm. Bz. | 53.90 | 54.44 | 53.84 | 56.96 |
| Mang. Bz | 56.54 | ..... | 50.14 | ..... |
| Phos. Bz. 5% | 75.34 | ..... | 75.84 | ..... |

Free Cutting Brass Rod ..... 32.73

### TITANIUM

*(Base prices, f.o.b. mill)*

Sheet and strip, commercially pure, $6.90-$7.40; alloy, $14.35. Plate, HR, commercially pure, $5.00-$5.75; alloy, $7.75-$8.50. Wire, rolled and/or drawn, commercially pure, $5.50-$6.00; alloy, $8.00-$9.50; Bar, HR or forged, commercially pure, $4.25-$4.65; alloy, $4.25-$7.15; billets, HR, commercially pure, $3.55-$4.10; alloy, $3.55-$5.75.

## PRIMARY METAL

*(Cents per lb unless otherwise noted)*

Antimony, American, Laredo, Tex.. 29.50
Beryllium aluminum 5% Be, Dollar per lb contained Be ..... $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading ..... $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.30
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic basis.. $ 1.31
Cobalt, 97-99% (per lb) ..... $1.75 to $1.82
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 35.00 to 42.00
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9%, dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz.... $75 to $85
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask f.o.b. New York ..... $230 to $235
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel ..... 69.60
Palladium, dollars per troy oz.. $16 to $18
Platinum, dollars per troy oz.. $77 to $80
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.) ..... 91.375
Thorium, per kg. ..... $43.00
Vanadium ..... $ 3.45
Zirconium sponge ..... $ 5.00

## REMELTED METALS

### Brass Ingot

*(Cents per lb delivered, carloads)*

85-5-5 ingot
- No. 115 ..... 32.25
- No. 120 ..... 31.00
- No. 123 ..... 30.00

80-10-10 ingot
- No. 305 ..... 36.50
- No. 315 ..... 34.50

88-10-2 ingot
- No. 210 ..... 45.50
- No. 215 ..... 41.25
- No. 245 ..... 37.00

Yellow ingot
- No. 405 ..... 26.50

Manganese bronze
- No. 421 ..... 29.75

### Aluminum Ingot

*(Cents per lb del'd 30,000 lb and over)*

95-5 aluminum-silicon alloys
- 0.30 copper max. ..... 24.75-25.00
- 0.60 copper max. ..... 24.50-24.75

Piston alloys (No. 122 type).. 24.25-25.25
No. 12 alum. (No. 2 grade)... 21.50-22.00
108 alloy ..... 22.00-22.50
195 alloy ..... 25.00-26.00
13 alloy (0.60 copper max.)... 24.25-24.75
AXS-679 (1 pct zinc) ..... 21.75-22.25

Steel deoxidizing aluminum notch bar granulated or shot

| | |
|---|---|
| Grade 1—95-97½% | 22.50-23.50 |
| Grade 2—92-95% | 21.25-22.25 |
| Grade 3—90-92% | 20.25-21.25 |
| Grade 4—85-90% | 17.50-18.50 |

(Effective April 6, 1959)

## SCRAP METALS

### Brass Mill Scrap

*(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)*

| | Heavy | Turnings |
|---|---|---|
| Copper | 27½ | 26¾ |
| Yellow brass | 20⅝ | 18¾ |
| Red brass | 24¼ | 23½ |
| Comm. bronze | 25⅛ | 24⅝ |
| Mang. bronze | 19⅛ | 18⅝ |
| Free cutting rod ends. | 20½ | |

### Customs Smelters Scrap

*(Cents per pound carload lots, delivered to refinery)*

| | |
|---|---|
| No. 1 copper wire | 29½ |
| No. 2 copper wire | 28 |
| Light copper | 25¾ |
| *Refinery brass | 27½ |
| Copper bearing material | 26½ |

*Dry copper content.

### Ingot Makers Scrap

*(Cents per pound carload lots, delivered to refinery)*

| | |
|---|---|
| No. 1 copper wire | 29½ |
| No. 2 copper wire | 28 |
| Light copper | 25¾ |
| No. 1 composition | 23 |
| No. 1 comp. turnings | 22½ |
| Hvy. yellow brass solids | 17 |
| Brass pipe | 17½ |
| Radiators | 18 |

*Aluminum*

| | |
|---|---|
| Mixed old cast. | 12 —13 |
| Mixed new clips | 15 —16 |
| Mixed turnings, dry | 13 —14 |

### Dealers' Scrap

*(Dealers' buying price f.o.b. New York in cents per pound)*

#### Copper and Brass

| | |
|---|---|
| No. 1 copper wire | 26½—27 |
| No. 2 copper wire | 24½—25 |
| Light copper | 22½—23 |
| Auto radiators (unsweated) | 16¼—16¾ |
| No. 1 composition | 21 —21½ |
| No. 1 composition turnings | 20 —20½ |
| Cocks and faucets | 16¾—17 |
| Clean heavy yellow brass | 15 —15¼ |
| Brass pipe | 16¾—17 |
| New soft brass clippings | 17½—18 |
| No. 1 brass rod turnings | 14¾—15 |

#### Aluminum

| | |
|---|---|
| Alum. pistons and struts | 6 — 6½ |
| Aluminum crankcase | 9½—10 |
| 1100 (2s) aluminum clippings | 13 —13½ |
| Old sheet and utensils | 9½—10 |
| Borings and turnings | 6 — 6½ |
| Industrial castings | 9½—10 |
| 2020 (24S) clippings | 11 —11½ |

#### Zinc

| | |
|---|---|
| New zinc clippings | 4¾— 5¼ |
| Old zinc | 3¼— 3½ |
| Zinc routings | 2 — 2¼ |
| Old die cast scrap | 1¾— 2 |

#### Nickel and Monel

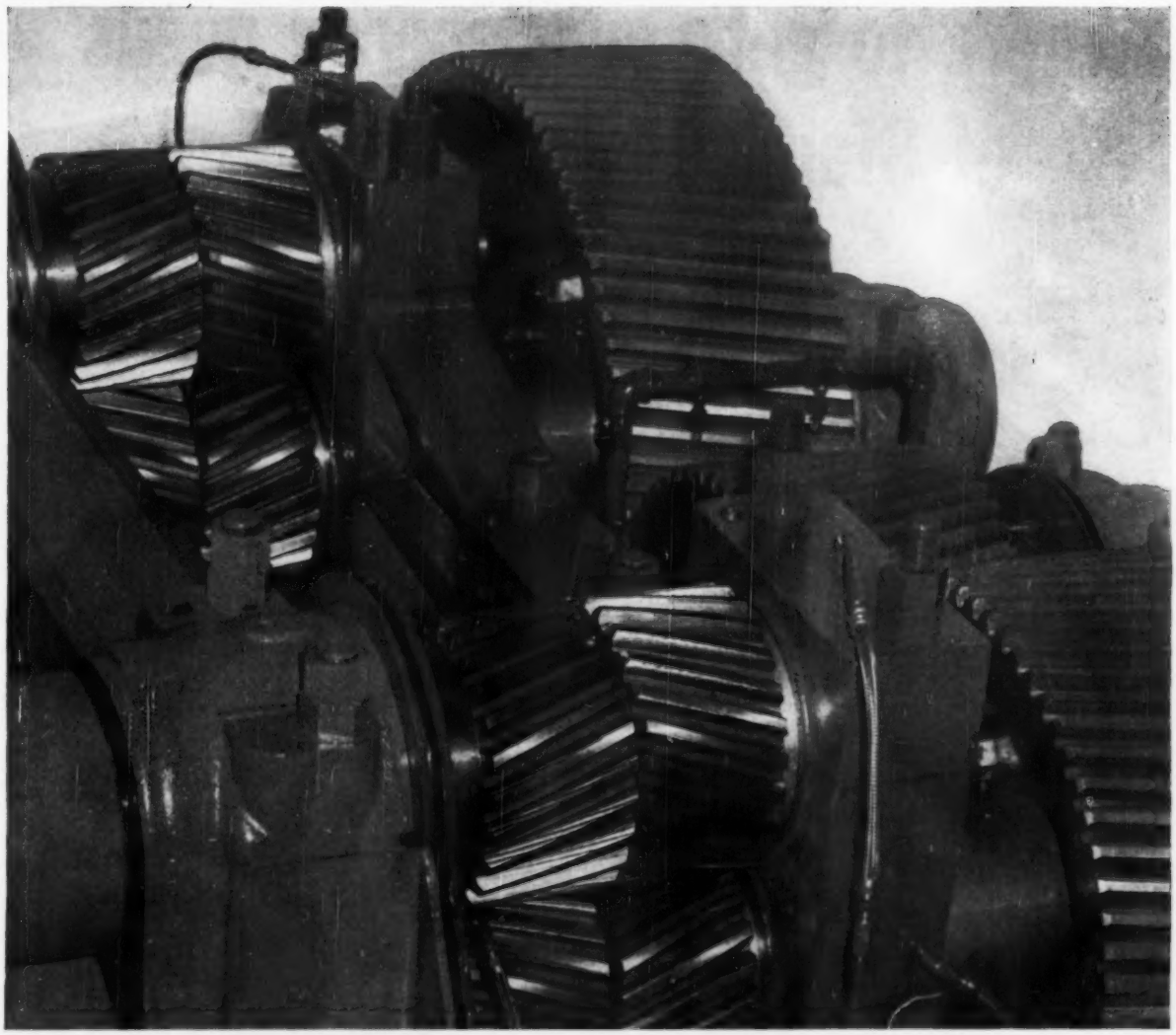
| | |
|---|---|
| Pure nickel clippings | 52-54 |
| Clean nickel turnings | 37-40 |
| Nickel anodes | 52-54 |
| Nickel rod ends | 52-54 |
| New Monel clippings | 30-32 |
| Clean Monel turnings | 30-32 |
| Old sheet Monel | 26-28 |
| Nickel Silver clippings, mixed | 18 |
| Nickel silver turnings, mixed | 15 |

#### Lead

| | |
|---|---|
| Soft scrap lead | 6½— 6¾ |
| Battery plates (dry) | 2 — 2¼ |
| Batteries, acid free | 1¾— 2 |

#### Miscellaneous

| | |
|---|---|
| Block tin | 77 —78 |
| No. 1 pewter | 59 —60 |
| Auto babbitt | 40 —41 |
| Mixer common babbitt | 9½—10 |
| Solder joints | 13¼—13¾ |
| Siphon tops | 42 |
| Small foundry type | 9½—10 |
| Monotype | 9½—10 |
| Lino. and stereotype | 8½— 9 |
| Electrotype | 7 — 7½ |
| Hand picked type shells | 5¼— 5¾ |
| Lino. and stereo. dross | 2¼— 2¾ |
| Electro dross | 2¼— 2¾ |



Rolling mill pinions of Type 4620 nickel-molybdenum steel have a good hard case (500/550 Brinell) plus toughness, stand up to severe overloads. Made by Morgan Construction Company, Worcester, Mass.

# 4620 Nickel alloy steel gives them 4 times longer service

Hardened rolling mill pinions in an Eastern steel plant were not giving satisfactory service, due to continuous overloading. They just weren't tough enough to take the beating of heavy rolling.

Designers solved the problem – called for pinions of 4620 nickel-moly carburized steel ground after hardening. Now they've got a good case – pinions don't crack . . . tough cores support them.

**This case stood up** – the 4620 nickel alloy steel pinions have served over *4 times longer* than the old through-hardened pinions . . . and are still going strong.

This high-performance pinion was *not* difficult to make. It was rough-machined at a hardness of 187/220 Brinell; showed little distortion through carburizing and hardening. Only 0.005" was needed for finish grinding, after hardening to 500/550 Brinell.

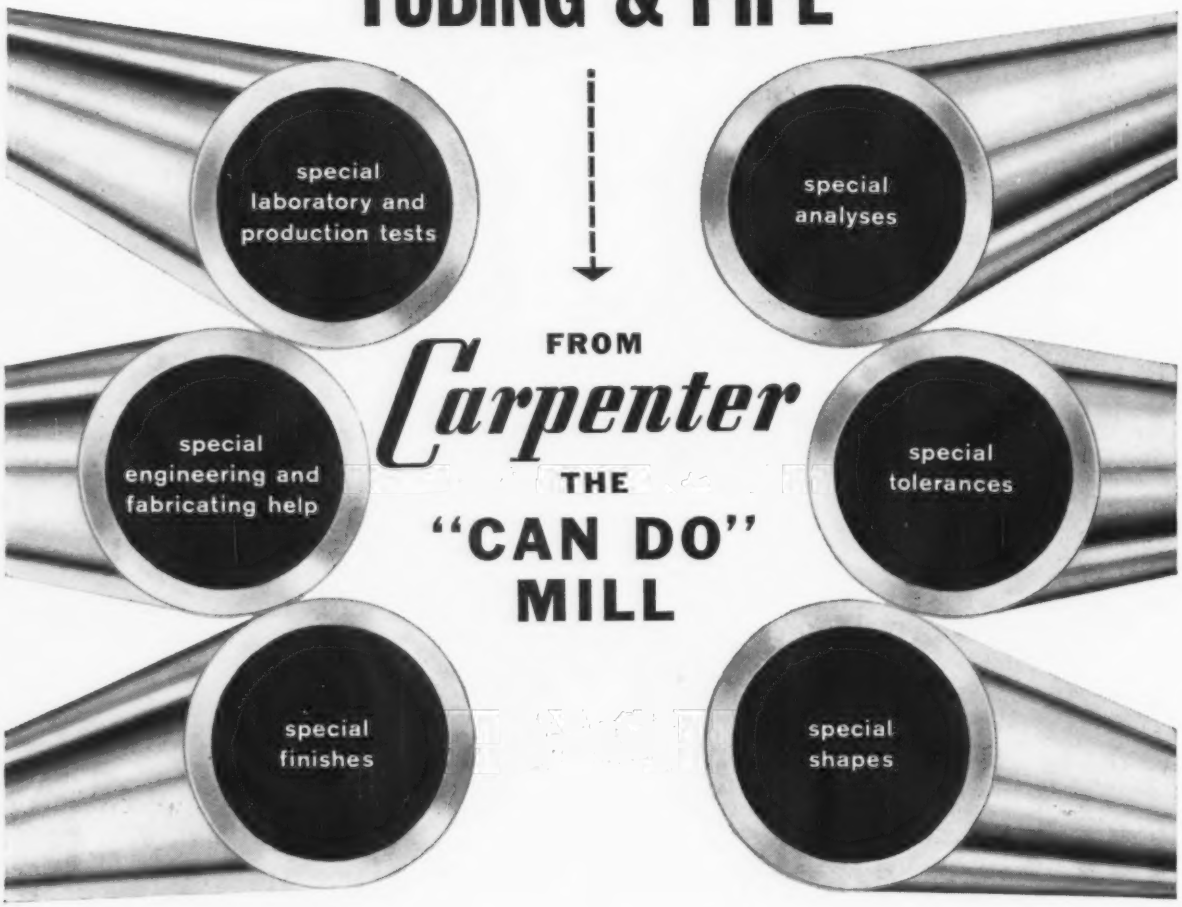
Parts that take a beating in heavy equipment must also have practical service life – you get both in nickel alloy materials.

**For practical information on 4620 nickel alloy steel** and its application to your specific metal problems, write Inco's Development and Research Division.

**THE INTERNATIONAL NICKEL COMPANY, INC.**
67 Wall Street · INCO · New York 5, N. Y.

# INCO NICKEL
## NICKEL ALLOYS PERFORM BETTER LONGER

# Where to get your "special needs" of Stainless and High Alloy TUBING & PIPE




*Anytime* you come up against *unusual* needs for stainless or high alloy tubing and pipe . . . anytime you are faced with hard-to-solve problems of corrosion, temperature conditions, fabrication, installation and design-engineering . . . it's time for you to consult with Carpenter. Save yourself time, worry and money by putting your "special needs" in our competent and experienced hands. Carpenter facilities and technical staff are geared to give you specialty services not available from other sources. Supplying plant engineers, equipment builders and product designers with the tubing, pipe and "know-how" to satisfy out-of-the-ordinary needs is a 32-year-old story with the Carpenter Alloy Tube Division. Whether your future needs are special or just ordinary, call in your Carpenter representative or contact The Carpenter Steel Company, Alloy Tube Division, Union, N. J.

*your master key to cost-saving corrosion control*

**Stainless & High Alloy Tubing & Pipe**

IRON AGE

# STEEL PRICES

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | | BILLETS, BLOOMS, SLABS | | | PIL-ING | SHAPES STRUCTURALS | | | STRIP | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Carbon Rerolling Net Ton | Carbon Forging Net Ton | Alloy Net Ton | Sheet Steel | Carbon | Hi Str. Low Alloy | Carbon Wide-Flange | Hot-rolled | Cold-rolled | Hi Str. H.R. Low Alloy | Hi Str. C.R. Low Alloy | Alloy Hot-rolled | Alloy Cold-rolled |
| EAST | Bethlehem, Pa. | | | $119.00 *B3* | | 5.55 *B3* | 8.10 *B3* | 5.55 *B5* | | | | | | |
| | Buffalo, N. Y. | $80.00 *R3, B3* | $99.50 *R3, B3* | $119.00 *R3, B3* | 6.50 *B3* | 5.55 *B3* | 8.10 *B3* | 5.55 *B3* | 5.10 *B3, R3* | 7.425 *S10, R7* | 7.575 *B3* | | | |
| | Phila., Pa. | | | | | | | | | 7.875 *P15* | | | | |
| | Harrison, N. J. | | | | | | | | | | | | | 15.55 *C11* |
| | Conshohocken, Pa. | | $104.50 *A2* | $126.00 *A2* | | | | | 5.15 *A2* | | 7.575 *A2* | | | |
| | New Bedford, Mass. | | | | | | | | | 7.875 *R6* | | | | |
| | Johnstown, Pa. | $80.00 *B3* | $99.50 *B3* | $119.00 *B3* | | 5.55 *B3* | 8.10 *B3* | | | | | | | |
| | Boston, Mass. | | | | | | | | | 7.975 *T8* | | | | |
| | New Haven, Conn. | | | | | | | | | 7.875 *D1* | | | | |
| | Baltimore, Md. | | | | | | | | | 7.425 *T8* | | | | 15.90 *T8* |
| | Phoenixville, Pa. | | | | | 5.55 *P2* | | 5.55 *P2* | | | | | | |
| | Sparrows Pt., Md. | | | | | | | | 5.10 *B3* | | 7.575 *B3* | | | |
| | New Britain, Bridgeport, Wallingford, Conn. | | | $119.00 *N8* | | | | | | 7.875 *W1,S7* | | | | |
| | Pawtucket, R. I. Worcester, Mass. | | | | | | | | | 7.975 *N7, A5* | | | | 15.90 *N7* 15.70 *T8* |
| MIDDLE WEST | Alton, Ill. | | | | | | | | 5.30 *L1* | | | | | |
| | Ashland, Ky. | | | | | | | | 5.10 *A7* | | 7.575 *A7* | | | |
| | Canton-Massillon, Dover, Ohio | | $102.00 *R3* | $119.00 *R3,* $114.00 *T5* | | | | | | 7.425 *G4* | | 10.80 *G4* | | |
| | Chicago, Franklin Park, Evanston, Ill. | $80.00 *U1, R3* | $99.50 *U1, R3,W8* | $119.00 *U1, R3,W8* | 6.50 *U1* | 5.50 *U1, W8,P13* | 8.05 *U1, Y1,W8* | 5.50 *U1* | 5.10 *W8, N4,A1* | 7.525 *A1, T8, M8* | 7.575 *W8* | | 8.40 *W8, S9,I3* | 15.55 *A1, S9,G4,T8* |
| | Cleveland, Ohio | | | | | | | | | 7.425 *A5,J3* | | 10.75 *A5* | 8.40 *J3* | |
| | Detroit, Mich. | | | $119.00 *R5* | | | | | 5.10 *G3, M2* | 7.425 *M2, S1, D1,P11* | 7.575 *G3* | 10.80 *S1* | | |
| | Anderson, Ind. | | | | | | | | | 7.425 *G4* | | | | |
| | Gary, Ind. Harbor, Indiana | $80.00 *U1* | $99.50 *U1* | $119.00 *U1, Y1* | | 5.50 *U1, I3* | 8.05 *U1, J3* | 5.50 *I3* | 5.10 *U1, I3,Y1* | 7.425 *Y1* | 7.575 *U1, I3,Y1* | 10.90 *Y1* | 8.40 *U1, Y1* | |
| | Sterling, Ill. | $80.00 *N4* | | | | 5.50 *N4* | 7.75 *N4* | 5.50 *N4* | 5.20 *N4* | | | | | |
| | Indianapolis, Ind. | | | | | | | | | 7.575 *R5* | | | | 15.70 *R5* |
| | Newport, Ky. | | | | | | | | 5.10 *A9* | | | | 8.40 *A9* | |
| | Niles, Warren, Ohio Sharon, Pa. | | $99.50 *S1,* $119.00 *C10* | $119.00 *C10,S1* | | | | | 5.10 *R3, S1* | 7.425 *R3, T4,S1* | 7.575 *R3, S1* | 10.80 *R3, S1* | 8.40 *S1* | 15.55 *S1* |
| | Owensboro, Ky. | $80.00 *G5* | $99.50 *G5* | $119.00 *G5* | | | | | | | | | | |
| | Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa. | $80.00 *U1, P6* | $99.50 *U1, C11,P6* | $119.00 *U1, C11,B7* | 6.50 *U1* | 5.50 *U1, J3* | 8.05 *U1, J3* | 5.50 *U1* | 5.10 *P6* | 7.425 *J3,B4* 7.525 *E3* | | | 8.40 *S9* | 15.55 *S9* |
| | Weirton, Wheeling, Follansbee, W. Va. | | | | 6.50 *U1, W3* | 5.50 *W3* | | 5.50 *W3* | 5.10 *W3* | 7.425 *F3* | 7.575 *W3* | 10.80 *W3* | | |
| | Youngstown, Ohio | $80.00 *R3* | $99.50 *Y1, C10* | $119.00 *Y1* | | | 8.05 *Y1* | | 5.10 *U* | 7.425 *Y1,R5* | 7.575 *U1, Y1* | 10.95 *Y1* | 8.40 *U1, Y1* | 15.55 *R5, Y1* |
| WEST | Fontana, Cal. | $90.50 *K1* | $109.00 *K1* | $140.00 *K1* | | 6.30 *K1* | 8.85 *K1* | 6.45 *K1* | 5.825 *K1* | 9.20 *K1* | | | | |
| | Geneva, Utah | | $99.50 *C7* | | | 5.50 *C7* | 8.05 *C7* | | | | | | | |
| | Kansas City, Mo. | | | | | 5.60 *S2* | 8.15 *S2* | | | | | | 8.65 *S2* | |
| | Los Angeles, Torrance, Cal. | | $109.00 *B2* | $139.00 *B2* | | 6.20 *C7, B2* | 8.75 *B2* | | 5.85 *C7, B2* | 9.30 *C1,R5* | | | 9.60 *B2* | 17.75 *J3* |
| | Minnequa, Colo. | | | | | 5.80 *C6* | | | 6.20 *C6* | 9.375 *C6* | | | | |
| | Portland, Ore. | | | | | 6.25 *O2* | | | | | | | | |
| | San Francisco, Niles, Pittsburg, Cal. | | $109.00 *B2* | | | 6.15 *B2* | 8.70 *B2* | | 5.85 *C7, B2* | | | | | |
| | Seattle, Wash. | | $113.00 *B2* | | | 6.25 *B2* | 8.80 *B2* | | 6.10 *B2* | | | | | |
| SOUTH | Atlanta, Ga. | | | | | 5.70 *A8* | | | 5.10 *A8* | | | | | |
| | Fairfield, Ala. City, Birmingham, Ala. | $80.00 *T2* | $99.50 *T2* | | | 5.50 *T2 R3,C16* | 8.05 *T2* | | 5.10 *T2, R3,C16* | | 7.575 *T2* | | | |
| | Houston, Lone Star, Texas | | $104.50 *S2* | $124.00 *S2* | | 5.60 *S2* | 8.15 *S2* | | | | | | 8.65 *S2* | |

(Effective April 6, 1959)

# STEEL PRICES

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | | SHEETS | | | | | | | | WIRE ROD | TINPLATE† | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Hot-rolled *18* ga. & hvyr. | Cold-rolled | Galvanized (Hot-dipped) | Enameling | Long Terne | Hi Str. Low Alloy H.R. | Hi Str. Low Alloy C.R. | Hi Str. Low Alloy Galv. | | Cokes* *1.25*-lb. base box | Electro** *0.25*-lb. base box | Holloware Enameling *29* ga. |
| EAST | Buffalo, N. Y. | 5.10 *B3* | 6.275 *B3* | | | | 7.525 *B3* | 9.275 *B3* | | 6.40 *W6* | † Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price, 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢. | | |
| | Claymont, Del. | | | | | | | | | | | | |
| | Coatesville, Pa. | | | | | | | | | | | | |
| | Conshohocken, Pa. | 5.15 *A2* | 6.325 *A2* | | | | 7.575 *A2* | | | | | | |
| | Harrisburg, Pa. | | | | | | | | | | | | |
| | Hartford, Conn. | | | | | | | | | | | | |
| | Johnstown, Pa. | | | | | | | | | 6.40 *B3* | | | |
| | Fairless, Pa. | 5.15 *U1* | 6.325 *U1* | | | | 7.575 *U1* | 9.325 *U1* | | | $10.50 *U1* | $9.20 *U1* | |
| | New Haven, Conn. | | | | | | | | | | | | |
| | Phoenixville, Pa. | | | | | | | | | | | | |
| | Sparrows Pt., Md. | 5.10 *B3* | 6.275 *B3* | 6.875 *B3* | | | 7.525 *B3* | 9.275 *B3* | 10.025 *B3* | 6.50 *B3* | $10.40 *B3* | $9.10 *B3* | |
| | Worcester, Mass. | | | | | | | | | 6.70 *A5* | | | |
| | Trenton, N. J. | | | | | | | | | | | | |
| MIDDLE WEST | Alton, Ill. | | | | | | | | | 6.60 *L1* | | | |
| | Ashland, Ky. | 5.10 *A7* | | 6.875 *A7* | 6.775 *A7* | | 7.525 *A7* | | | | | | |
| | Canton-Massillon, Dover, Ohio | | | 6.875 *R1, R3* | | | | | | | | | |
| | Chicago, Joliet, Ill. | 5.10 *W8, A1* | | | | | 7.525 *U1, W8* | | | 6.40 *A5, R3,W8* | | | |
| | Sterling, Ill. | | | | | | | | | 6.50 *N4, K2* | | | |
| | Cleveland, Ohio | 5.10 *R3, J3* | 6.275 *R3, J3* | 7.65 *R3** | 6.775 *R3* | | 7.525 *R3, J3* | 9.275 *R3, J3* | | 6.40 *A5* | | | |
| | Detroit, Mich. | 5.10 *G3, M2* | 6.275 *G3, M2* | | | | 7.525 *G3* | 9.275 *G3* | | | | | |
| | Newport, Ky. | 5.10 *A1* | 6.275 *A1* | | | | | | | | | | |
| | Gary, Ind. Harbor, Indiana | 5.10 *U1, I3,Y1* | 6.275 *U1, I3,Y1* | 6.875 *U1, I3* | 6.775 *U1, I3,Y1* | 7.225 *U1* | 7.525 *U1, Y1,I3* | 9.275 *U1, Y1* | | 6.40 *Y1* | $10.40 *U1, Y1* | $9.10 *I3, U1,Y1* | 7.85 *U1, Y1* |
| | Granite City, Ill. | 5.20 *G2* | 6.375 *G2* | 6.975 *G2* | 6.875 *G2* | | | | | | | $9.20 *G2* | 7.95 *G2* |
| | Kokomo, Ind. | | | 6.975 *C9* | | | | | | 6.50 *C9* | | | |
| | Mansfield, Ohio | 5.10 *E2* | 6.275 *E2* | | | 7.225 *E2* | | | | | | | |
| | Middletown, Ohio | | 6.275 *A7* | 6.875 *A7* | 6.775 *A7* | 7.225 *A7* | | | | | | | |
| | Niles, Warren, Ohio Sharon, Pa. | 5.10 *R3, S1* | 6.275 *R3* | 6.875 *R3* 7.65 *R3** | 6.775 *S1* | 7.225 *S1*, *R3* | 7.525 *R3, S1* | 9.275 *R3,* | | | | $9.10 *R3* | |
| | Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa. | 5.10 *U1, J3,P6* | 6.275 *U1, J3,P6* | 6.875 *U1, J3* 7.50 *E3** | 6.775 *U1* | | 7.525 *U1, J3* | 9.275 *U1, J3* | 10.025 *U1, J3* | 6.40 *A5, J3,P6* | $10.40 *W5, J3* | $9.10 *U1, J3* | 7.85 *U1, J3* |
| | Portsmouth, Ohio | 5.10 *P7* | 6.275 *P7* | | | | | | | 6.40 *P7* | | | |
| | Weirton, Wheeling, Follansbee, W. Va. | 5.10 *W3, W5* | 6.275 *W3, F3,W5* | 6.875 *W3, W5* 7.50 *W3** | | 7.225 *W3, W5* | 7.525 *W3* | 9.275 *W3* | | | $10.40 *W5, W3* | $9.10 *W5, W3* | 7.85 *W5* |
| | Youngstown, Ohio | 5.10 *U1, Y1* | 6.275 *Y1* | 7.50 *J3** | 6.775 *Y1* | | 7.525 *Y1* | 9.275 *Y1* | | 6.40 *Y1* | | | |
| WEST | Fontana, Cal. | 5.825 *K1* | 7.40 *K1* | | | | 8.25 *K1* | 10.40 *K1* | | | $11.05 *K1* | $9.75 *K1* | |
| | Geneva, Utah | 5.20 *C7* | | | | | | | | | | | |
| | Kansas City, Mo. | | | | | | | | | 6.65 *S2* | | | |
| | Los Angeles, Torrance, Cal. | | | | | | | | | 7.20 *B2* | | | |
| | Minnequa, Colo. | | | | | | | | | 6.65 *C6* | | | |
| | San Francisco, Niles, Pittsburg, Cal. | 5.80 *C7* | 7.225 *C7* | 7.625 *C7* | | | | | | 7.20 *C7* | $11.05 *C7* | $9.75 *C7* | |
| SOUTH | Atlanta, Ga. | | | | | | | | | | | | |
| | Fairfield, Ala. Alabama City, Ala. | 5.10 *T2, R3* | 6.275 *T2, R3* | 6.875 *T2, R3* | 6.775 *T2* | | | | | 6.40 *T2,R3* | $10.50 *T2* | $9.20 *T2* | |
| | Houston, Texas | | | | | | | | | 6.65 *S2* | | | |

* Electrogalvanized sheets.

(Effective April 6, 1959)

*7.425 at Sharon-Niles is 7.225

IRON AGE

# STEEL PRICES

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | | BARS | | | | | | PLATES | | | | WIRE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Carbon† Steel | Reinforcing | Cold Finished | Alloy Hot-rolled | Alloy Cold Drawn | Hi Str. H.R. Low Alloy | Carbon Steel | Floor Plate | Alloy | Hi Str. Low Alloy | Mfr's. Bright |
| EAST | Bethlehem, Pa. | | | | 6.725 *B3* | 9.025 *B3* | 8.30 *B3* | | | | | |
| | Buffalo, N. Y. | 5.675 *R3,B3* | 5.675 *R3,B3* | 7.70 *B5* | 6.725 *B3,R3* | 9.025 *B3,B5* | 8.30 *B3* | 5.30 *B3* | | | | 8.00 *W6* |
| | Claymont, Del. | | | | | | | 5.30 *C4* | | 7.50 *C4* | 7.95 *C4* | |
| | Coatesville, Pa. | | | | | | | 5.30 *L4* | | 7.50 *L4* | 7.95 *L4* | |
| | Conshohocken, Pa. | | | | | | | 5.30 *A2* | 6.375 *A2* | 7.50 *A2* | 7.95 *A2* | |
| | Harrisburg, Pa. | | | | | | | 5.30 *P2* | 6.375 *P2* | | | |
| | Milton, Pa. | 5.825 *M7* | 5.825 *M7* | | | | | | | | | |
| | Hartford, Conn. | | | 8.15 *R3* | | 9.325 *R3* | | | | | | |
| | Johnstown, Pa. | 5.675 *B3* | 5.675 *B3* | | 6.725 *B3* | | 8.30 *B3* | 5.30 *B3* | | 7.50 *B3* | 7.95 *B3* | 8.00 *B3* |
| | Fairless, Pa. | 5.825 *U1* | 5.825 *U1* | | 6.875 *U1* | | | | | | | |
| | Newark, Camden, N. J. | | | 8.10 *W10, P10* | | 9.20 *W10, P10* | | | | | | |
| | Bridgeport, Putnam, Willimantic, Conn. | | | 8.20 *W10* 8.15 *J3* | 6.80 *N8* | 9.175 *N8* | | | | | | |
| | Sparrows Pt., Md. | | 5.675 *B3* | | | | | 5.30 *B3* | | 7.50 *B3* | 7.95 *B3* | 8.10 *B3* |
| | Palmer, Worcester, Readville, Mansfield, Mass. | | | 8.20 *B5, C14* | | 9.325 *A5,B5* | | | | | | 8.30 *A5, W6* |
| | Spring City, Pa. | | | 8.10 *K4* | | 9.20 *K4* | | | | | | |
| MIDDLE WEST | Alton, Ill. | 5.875 *L1* | | | | | | | | | | 8.20 *L1* |
| | Ashland, Newport, Ky. | | | | | | | 5.30 *A7, A9* | | 7.50 *A9* | 7.95 *A7* | |
| | Canton, Massillon, Mansfield, Ohio | 6.15* *R3* | | 7.65 *R3,R2* | 6.725 *R3* 6.475 *T5* | 9.025 *R3,R2* 8.775 *T5* | | 5.30 *E2* | | | | |
| | Chicago, Joliet, Waukegan, Madison, Harvey, Ill. | 5.675 *U1,R3, W8,N4,P13* | 5.675 *U1,R3, N4,P13,W8* 5.875 *L1* | 7.65 *A5, W10,W8, B5,L2,N9* | 6.725 *U1,R3, W8* | 9.025 *A5, W10,W8, L2,N8,B5* | 8.30 *U1,W8, R3* | 5.30 *U1,A1, W8,I3* | 6.375 *U1* | 7.50 *U1, W8* | 7.95 *U1, W8* | 8.00 *A5,R3, W8,N4, K2,W7* |
| | Cleveland, Elyria, Ohio | 5.675 *R3* | 5.675 *R3* | 7.65 *A5,C13, C18* | | 9.025 *A5, C13,C18* | 8.30 *R3* | 5.30 *R3,J3* | 6.375 *J3* | | 7.95 *R3,J3* | 8.00 *A5, C13,C18* |
| | Detroit, Mich. | 5.675 *G3* | 5.675 *G3* | 7.90 *P3* 7.85 *P8,B5* 7.65 *R5* | 6.725 *R5,G3* | 9.025 *R5* 9.225 *B5,P3, P8* | 8.30 *G3* | 5.30 *G3* | | 7.50 *G3* | 7.95 *G3* | |
| | Duluth, Minn. | | | | | | | | | | | 8.00 *A5* |
| | Gary, Ind. Harbor, Crawfordsville, Hammond, Ind. | 5.675 *U1,I3, Y1* | 5.675 *U1,I3, Y1* | 7.65 *R3,J3* | 6.725 *U1,I3, Y1* | 9.025 *R3,M4* | 8.30 *U1,Y1* | 5.30 *U1,I3, Y1* | 6.375 *J3, I1* | 7.50 *U1, Y1* | 7.95 *U1, Y1,I3* | 8.10 *M4* |
| | Granite City, Ill. | | | | | | | 5.40 *G2* | | | | |
| | Kokomo, Ind. | | 5.775 *C9* | | | | | | | | | 8.10 *C9* |
| | Sterling, Ill. | 5.775 *N4* | 5.775 *N4* | | | | | 5.30 *N4* | | | | 8.10 *K2* |
| | Niles, Warren, Ohio Sharon, Pa. | | | 7.65 *C10* | 6.725 *C10,* | 9.025 *C10* | | 5.30 *R3,S1* | | 7.50 *S1* | 7.95 *R3, S1* | |
| | Owensboro, Ky. | 5.675 *G5* | | | 6.725 *G5* | | | | | | | |
| | Pittsburgh, Midland, Donora, Aliquippa, Pa. | 5.675 *U1,J3* | 5.675 *U1,J3* | 7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9* | 6.725 *U1,J3, C11,B7* | 9.025 *A5, W10,R3,S9, C11,C8,M9* | 8.30 *U1,J3* | 5.30 *U1,J3* | 6.375 *U1,J3* | 7.50 *U1, J3,B7* | 7.95 *U1, J3,B7* | 8.00 *A5, J3,P6* |
| | Portsmouth, Ohio | | | | | | | | | | | 8.00 *P7* |
| | Weirton, Wheeling, Follansbee, W. Va. | | | | | | | 5.30 *W5* | | | | |
| | Youngstown, Ohio | 5.675 *U1,R3, Y1* | 5.675 *U1,R3, Y1* | 7.65 *A1,Y1, F2* | 6.725 *U1,Y1* | 9.025 *Y1,F2* | 8.30 *U1,Y1* | 5.30 *U1, R3,Y1* | | 7.50 *Y1* | 7.95 *U1,Y1* | 8.00 *Y1* |
| WEST | Emeryville, Fontana, Cal. | 6.425 *J5* 6.375 *K1* | 6.425 *J5* 6.375 *K1* | | 7.775 *K1* | | 9.00 *K1* | 6.10 *K1* | | 8.30 *K1* | 8.75 *K1* | |
| | Geneva, Utah | | | | | | | 5.30 *C7* | | | 7.95 *C7* | |
| | Kansas City, Mo. | 5.925 *S2* | 5.925 *S2* | | 6.975 *S2* | | 8.55 *S2* | | | | | 8.25 *S2* |
| | Los Angeles, Torrance, Cal. | 6.375 *C7,B2* | 6.375 *C7,B2* | 9.10 *R3,P14, S12* | 7.775 *B2* | 11.00 *P14, S12* | 8.625 *B2* | | | | | 8.95 *B2* |
| | Minnequa, Colo. | 6.125 *C6* | 6.125 *C6* | | | | | 6.15 *C6* | | | | 8.25 *C6* |
| | Portland, Ore. | 6.425 *O2* | 6.425 *O2* | | | | | | | | | |
| | San Francisco, Niles, Pittsburg, Cal. | 6.375 *C7* 6.425 *B2* | 6.375 *C7* 6.425 *B2* | | | | 8.675 *B2* | | | | | 8.95 *C7,C6* |
| | Seattle, Wash. | 6.425 *B2,N6* | 6.425 *B2* | | | | 8.675 *B2* | 6.20 *B2* | | 8.40 *B2* | 8.85 *B2* | |
| SOUTH | Atlanta, Ga. | 5.875 *A8* | 5.675 *A8* | | | | | | | | | 8.00 *A8* |
| | Fairfield City, Ala. Birmingham, Ala. | 5.675 *T2,R3, C16* | 5.675 *T2,R3, C16* | 8.25 *C16* | | | 8.30 *T2* | 5.30 *T2,R3* | | | 7.95 *T2* | 8.00 *T2,R3* |
| | Houston, Ft. Worth, Lone Star, Texas | 5.925 *S2* | 5.925 *S2* | | 6.975 *S2* | | 8.55 *S2* | 5.40 *S2* | | 7.60 *S2* | 8.05 *S2* | 8.25 *S2* |

† Merchant Quality—Special Quality 35¢ higher. (Effective April 6, 1959) * Special Quality.

## Key to Steel Producers

### With Principal Offices

*A1* Acme Steel Co., Chicago
*A2* Alan Wood Steel Co., Conshohocken, Pa.
*A3* Allegheny Ludlum Steel Corp., Pittsburgh
*A4* American Cladmetals Co., Carnegie, Pa.
*A5* American Steel & Wire Div., Cleveland
*A6* Angel Nail & Chaplet Co., Cleveland
*A7* Armco Steel Corp., Middletown, Ohio
*A8* Atlantic Steel Co., Atlanta, Ga.
*A9* Acme-Newport Steel Co., Newport, Ky.

*B1* Babcock & Wilcox Tube Div., Beaver Falls, Pa.
*B2* Bethlehem Pacific Coast Steel Corp., San Francisco
*B3* Bethlehem Steel Co., Bethlehem, Pa.
*B4* Blair Strip Steel Co., New Castle, Pa.
*B5* Bliss & Laughlin, Inc., Harvey, Ill.
*B6* Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
*B7* A. M. Byers, Pittsburgh
*B8* Braeburn Alloy Steel Corp., Braeburn, Pa.

*C1* Calstrip Steel Corp., Los Angeles
*C2* Carpenter Steel Co., Reading, Pa.
*C4* Claymont Products Dept., Claymont, Del.
*C6* Colorado Fuel & Iron Corp., Denver
*C7* Columbia Geneva Steel Div., San Francisco
*C8* Columbia Steel & Shafting Co., Pittsburgh
*C9* Continental Steel Corp., Kokomo, Ind.
*C10* Copperweld Steel Co., Pittsburgh, Pa.
*C11* Crucible Steel Co. of America, Pittsburgh
*C13* Cuyahoga Steel & Wire Co., Cleveland
*C14* Compressed Steel Shafting Co., Readville, Mass.
*C15* G. O. Carlson, Inc., Thorndale, Pa.
*C16* Connors Steel Div., Birmingham
*C18* Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

*D1* Detroit Steel Corp., Detroit
*D2* Driver, Wilbur B., Co., Newark, N. J.
*D3* Driver Harris Co., Harrison, N. J.
*D4* Dickson Weatherproof Nail Co., Evanston, Ill.

*E1* Eastern Stainless Steel Corp., Baltimore
*E2* Empire-Reeves Steel Corp., Mansfield, O.
*E3* Enamel Products & Plating Co., McKeesport, Pa.

*F1* Firth Sterling, Inc., McKeesport, Pa.
*F2* Fitzsimons Steel Corp., Youngstown
*F3* Follansbee Steel Corp., Follansbee, W. Va.

*G2* Granite City Steel Co., Granite City, Ill.
*G3* Great Lakes Steel Corp., Detroit
*G4* Greer Steel Co., Dover, O.
*G5* Green River Steel Corp., Owenboro, Ky.

*H1* Hanna Furnace Corp., Detroit

*I2* Ingersoll Steel Div., Chicago
*I3* Inland Steel Co., Chicago
*I4* Interlake Iron Corp., Cleveland

*J1* Jackson Iron & Steel Co., Jackson, O.
*J2* Jessop Steel Corp., Washington, Pa.
*J3* Jones & Laughlin Steel Corp., Pittsburgh
*J4* Joslyn Mfg. & Supply Co., Chicago
*J5* Judson Steel Corp., Emeryville, Calif.

*K1* Kaiser Steel Corp., Fontana, Calif.
*K2* Keystone Steel & Wire Co., Peoria
*K3* Koppers Co., Granite City, Ill.
*K4* Keystone Drawn Steel Co., Spring City, Pa.

*L1* Laclede Steel Co., St. Louis
*L2* La Salle Steel Co., Chicago
*L3* Lone Star Steel Co., Dallas
*L4* Lukens Steel Co., Coatesville, Pa.

*M1* Mahoning Valley Steel Co., Niles, O.
*M2* McLouth Steel Corp., Detroit
*M3* Mercer Tube & Mfg. Co., Sharon, Pa.
*M4* Mid States Steel & Wire Co., Crawfordsville, Ind.
*M6* Mystic Iron Works, Everett, Mass.
*M7* Milton Steel Products Div., Milton, Pa.
*M8* Mill Strip Products Co., Evanston, Ill.
*M9* Moltrup Steel Products Co., Beaver Falls, Pa.

*N1* National Supply Co., Pittsburgh
*N2* National Tube Div., Pittsburgh
*N4* Northwestern Steel & Wire Co., Sterling, Ill.
*N6* Northwest Steel Rolling Mills, Seattle
*N7* Newman Crosby Steel Co., Pawtucket, R. I.
*N8* Carpenter Steel of New England, Inc., Bridgeport, Conn.
*N9* Nelson Steel & Wire Co.

*O1* Oliver Iron & Steel Co., Pittsburgh
*O2* Oregon Steel Mills, Portland

*P1* Page Steel & Wire Div., Monessen, Pa.
*P2* Phoenix Steel Corp., Phoenixville, Pa.
*P3* Pilgrim Drawn Steel Div., Plymouth, Mich.
*P4* Pittsburgh Coke & Chemical Co., Pittsburgh
*P5* Pittsburgh Screw & Bolt Co., Pittsburgh
*P6* Pittsburgh Steel Co., Pittsburgh
*P7* Portsmouth Div., Detroit Steel Corp., Detroit
*P8* Plymouth Steel Co., Detroit
*P9* Pacific States Steel Co., Niles, Cal.
*P10* Precision Drawn Steel Co., Camden, N. J.
*P11* Production Steel Strip Corp., Detroit
*P13* Phoenix Mfg. Co., Joliet, Ill.
*P14* Pacific Tube Co.
*P15* Philadelphia Steel and Wire Corp.

*R2* Reliance Div., Eaton Mfg. Co., Massillon, O.
*R3* Republic Steel Corp., Cleveland
*R4* Roebling Sons Co., John A., Trenton, N. J.
*R5* Jones & Laughlin Steel Corp., Stainless and Strip Div.
*R6* Rodney Metals, Inc., New Bedford, Mass.
*R7* Rome Strip Steel Co., Rome, N. Y.

*S1* Sharon Steel Corp., Sharon Pa.
*S2* Sheffield Steel Div., Kansas City
*S3* Shenango Furnace Co., Pittsburgh
*S4* Simonds Saw and Steel Co., Fitchburg, Mass.
*S5* Sweet's Steel Co., Williamsport, Pa.
*S7* Stanley Works, New Britain, Conn.
*S8* Superior Drawn Steel Co., Monaca, Pa.
*S9* Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
*S10* Seneca Steel Service, Buffalo
*S11* Southern Electric Steel Co., Birmingham
*S12* Sierra Drawn Steel Corp., Los Angeles, Calif.
*S13* Seymour Mfg. Co., Seymour, Conn.

*T1* Tonawanda Iron Div., N. Tonawanda, N. Y.
*T2* Tennessee Coal & Iron Div., Fairfield
*T3* Tennessee Products & Chem. Corp., Nashville
*T4* Thomas Strip Div., Warren, O.
*T5* Timken Steel & Tube Div., Canton, O.
*T7* Texas Steel Co., Fort Worth
*T8* Thompson Wire Co., Boston

*U1* United States Steel Corp., Pittsburgh
*U2* Universal-Cyclops Steel Corp., Bridgeville, Pa.
*U3* Ulbrich Stainless Steels, Wallingford, Conn.
*U4* U. S. Pipe & Foundry Co., Birmingham

*W1* Wallingford Steel Co., Wallingford, Conn.
*W2* Washington Steel Corp., Washington, Pa.
*W3* Weirton Steel Co., Weirton, W. Va.
*W4* Wheatland Tube Co., Wheatland, Pa.
*W5* Wheeling Steel Corp., Wheeling, W. Va.
*W6* Wickwire Spencer Steel Div., Buffalo
*W7* Wilson Steel & Wire Co., Chicago.
*W8* Wisconsin Steel Div., S. Chicago, Ill.
*W9* Woodward Iron Co., Woodward, Ala.
*W10* Wyckoff Steel Co., Pittsburgh
*W12* Wallace Barnes Steel Div., Bristol, Conn.

*Y1* Youngstown Sheet & Tube Co., Youngstown, O.

## PIPE AND TUBING

**Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.**

| | BUTTWELD | | | | | | | | | | | | | | SEAMLESS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ½ In. | | ¾ In. | | 1 In. | | 1¼ In. | | 1½ In. | | 2 In. | | 2½–3 In. | | 2 In. | | 2½ In. | | 3 In. | | 3½–4 In. | |
| STANDARD T. & C. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. |
| Sparrows Pt. *B3* | 0.25 | +15.0 | 3.25 | +11.0 | 6.75 | +6.50 | 9.25 | +5.75 | 9.75 | +4.75 | 10.25 | +4.25 | 11.75 | +4.50 | | | | | | | | |
| Youngstown *R3* | 2.25 | +13.0 | 5.25 | +9.0 | 8.75 | +4.50 | 11.25 | +3.75 | 11.75 | +2.75 | 12.25 | +2.25 | 13.75 | +2.50 | | | | | | | | |
| Fontana *K1* | +10.75 | +26.00 | +7.75 | +22.00 | +4.25 | +17.50 | +1.75 | +16.75 | +1.25 | +15.75 | +0.75 | +15.25 | 0.75 | +15.50 | | | | | | | | |
| Pittsburgh *J3* | 2.25 | +13.0 | 5.25 | +9.0 | 8.75 | +4.50 | 11.25 | +3.75 | 11.75 | +2.75 | 12.25 | +2.25 | 13.75 | +2.50 | +12.25 | +27.25 | +5.75 | +22.50 | +3.25 | +20.0 | +1.75 | +18.50 |
| Alton, Ill. *L1* | 0.25 | +15.0 | 3.25 | +11.0 | 6.75 | +6.50 | 9.25 | +5.75 | 9.75 | +4.75 | 10.25 | +4.25 | 11.75 | +4.50 | | | | | | | | |
| Sharon *M3* | 2.25 | +13.0 | 5.25 | +9.0 | 8.75 | +4.50 | 11.25 | +3.75 | 11.75 | +2.75 | 12.25 | +2.25 | 13.75 | +2.50 | | | | | | | | |
| Fairless *N2* | 0.25 | +15.0 | 3.25 | +11.0 | 6.75 | +6.50 | 9.25 | +5.75 | 9.75 | +4.75 | 10.25 | +4.25 | 11.75 | +4.50 | | | | | | | | |
| Pittsburgh *N1* | 2.25 | +13.0 | 5.25 | +9.0 | 8.75 | +4.50 | 11.25 | +3.75 | 11.75 | +2.75 | 12.25 | +2.25 | 13.75 | +2.50 | +12.25 | +27.25 | +5.75 | +22.50 | +3.25 | +20.0 | +1.75 | +18.50 |
| Wheeling *W5* | 2.25 | +13.0 | 5.25 | +9.0 | 8.75 | +4.50 | 11.25 | +3.75 | 11.75 | +2.75 | 12.25 | +2.25 | 13.75 | +2.50 | | | | | | | | |
| Wheatland *W4* | 2.25 | +13.0 | 5.25 | +9.0 | 8.75 | +4.50 | 11.25 | +3.75 | 11.75 | +2.75 | 12.25 | +2.25 | 13.75 | +2.50 | | | | | | | | |
| Youngstown *Y1* | 2.25 | +13.0 | 5.25 | +9.0 | 8.75 | +4.50 | 11.25 | +3.75 | 11.75 | +2.75 | 12.25 | +2.25 | 13.75 | +2.50 | +12.25 | +27.25 | +5.75 | +22.50 | +3.25 | +20.0 | +1.75 | +18.50 |
| Indiana Harbor *Y1* | 1.25 | +14.0 | 4.25 | +10.0 | 7.75 | +5.50 | 10.25 | +4.75 | 10.75 | +3.75 | 11.25 | +3.25 | 12.75 | +3.50 | | | | | | | | |
| Lorain *N2* | 2.25 | +13.0 | 5.25 | +9.0 | 8.75 | +4.50 | 11.25 | +3.75 | 11.75 | +2.75 | 12.25 | +2.25 | 13.75 | +2.50 | +12.25 | +27.25 | +5.75 | +22.50 | +3.25 | +20.0 | +1.75 | +18.50 |
| **EXTRA STRONG PLAIN ENDS** | | | | | | | | | | | | | | | | | | | | | | |
| Sparrows Pt. *B3* | 4.75 | +9.0 | 8.75 | +5.0 | 11.75 | +0.50 | 12.25 | +1.75 | 12.75 | +0.75 | 13.25 | +0.25 | 13.75 | +1.50 | | | | | | | | |
| Youngstown *R3* | 6.75 | +7.0 | 10.75 | +3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | | | | | | | | |
| Fairless *N2* | 4.75 | +9.0 | 8.75 | +5.0 | 11.75 | +0.50 | 12.25 | +1.75 | 12.75 | +0.75 | 13.25 | +0.25 | 13.75 | +1.50 | | | | | | | | |
| Fontana *K1* | +6.25 | | +2.25 | | 0.75 | | 1.25 | | 1.75 | | 2.25 | | 2.75 | | | | | | | | | |
| Pittsburgh *J3* | 6.75 | +7.0 | 10.75 | +3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | +10.75 | +24.75 | +3.25 | +19.0 | +0.75 | +16.50 | 4.25 | +11.50 |
| Alton, Ill. *L1* | 4.75 | +9.0 | 8.75 | +5.0 | 11.75 | +0.50 | 12.25 | +1.75 | 12.75 | +0.75 | 13.25 | +0.25 | 13.75 | +1.50 | | | | | | | | |
| Sharon *M3* | 6.75 | +7.0 | 10.75 | +3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | | | | | | | | |
| Pittsburgh *N1* | 6.75 | +7.0 | 10.75 | +3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | +10.75 | +24.75 | +3.25 | +19.0 | +0.75 | +16.50 | 4.25 | +11.50 |
| Wheeling *W5* | 6.75 | +7.0 | 10.75 | +3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | | | | | | | | |
| Wheatland *W4* | 6.75 | +7.0 | 10.75 | +3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | | | | | | | | |
| Youngstown *Y1* | 6.75 | +7.0 | 10.75 | +3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | +10.75 | +24.75 | +3.25 | +19.0 | +0.75 | +16.50 | 4.25 | +11.50 |
| Indiana Harbor *Y1* | 5.75 | +8.0 | 9.75 | +4.0 | 12.75 | 0.50 | 13.25 | +0.75 | 13.75 | 0.25 | 14.25 | 0.75 | 14.75 | +0.50 | | | | | | | | |
| Lorain *N2* | 6.75 | +7.0 | 10.75 | +3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | +10.75 | +24.75 | +3.25 | +19.0 | +0.75 | +16.50 | 4.25 | +11.50 |

**Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.**
**Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.00¢ per lb.**

(Effective April 6, 1959)

## TOOL STEEL

*F.o.b. mill*

| W | Cr | V | Mo | Co | per lb | SAE |
|---|---|---|---|---|---|---|
| 18 | 4 | 1 | — | — | $1.84 | T-1 |
| 18 | 4 | 1 | — | 5 | 2.545 | T-4 |
| 18 | 4 | 2 | — | — | 2.005 | T-2 |
| 1.5 | 4 | 1.5 | 8 | — | 1.20 | M-1 |
| 6 | 4 | 3 | 6 | — | 1.59 | M-3 |
| 6 | 4 | 2 | 5 | — | 1.345 | M-2 |
| High-carbon chromium | | | | | .955 | D-3, D-5 |
| Oil hardened manganese | | | | | .505 | O-2 |
| Special carbon | | | | | .38 | W-1 |
| Extra carbon | | | | | .38 | W-1 |
| Regular carbon | | | | | .325 | W-1 |

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

## CLAD STEEL

Base prices, cents per lb f.o.b.

| | Cladding | Plate (*L4, C4, A3, J2*) 10 pct | Plate (*L4, C4, A3, J2*) 15 pct | Plate (*L4, C4, A3, J2*) 20 pct | Sheet (*I2*) 20 pct |
|---|---|---|---|---|---|
| Stainless Type | 302 | ..... | ..... | ..... | 37.50 |
| | 304 | 28.80 | 31.55 | 34.30 | 40.00 |
| | 316 | 42.20 | 46.25 | 50.25 | 58.75 |
| | 321 | 34.50 | 37.75 | 41.05 | 47.25 |
| | 347 | 40.80 | 44.65 | 48.55 | 57.00 |
| | 405 | 24.60 | 26.90 | 29.25 | ..... |
| | 410 | 22.70 | 24.85 | 27.00 | ..... |
| | 430 | 23.45 | 25.65 | 27.90 | ..... |

CR Strip (S9) Copper, 10 pct, 2 sides, 43.15; 1 side, 36.20.

## RAILS, TRACK SUPPLIES

| F.o.b. Mill Cents Per Lb | No. 1 Std. Rails | Light Rails | Joint Bars | Track Spikes | Tie Plates | Track Bolts Untreated |
|---|---|---|---|---|---|---|
| Bessemer *U1* | 5.75 | 6.725 | 7.25 | ..... | ..... | ..... |
| Cleveland *R3* | ..... | ..... | ..... | ..... | ..... | 15.35 |
| So. Chicago *R3* | ..... | ..... | ..... | 10.10 | ..... | ..... |
| Ensley *T2* | 5.75 | 6.725 | ..... | ..... | ..... | ..... |
| Fairfield *T2* | ..... | 6.725 | ..... | 10.10 | 6.875 | ..... |
| Gary *U1* | 5.75 | ..... | ..... | ..... | 6.875 | ..... |
| Ind. Harbor *I3* | ..... | ..... | ..... | 10.10 | ..... | ..... |
| Johnstown *B3* | ..... | 6.725 | ..... | ..... | ..... | ..... |
| Joliet *U1* | ..... | ..... | 7.25 | ..... | ..... | ..... |
| Kansas City *S2* | ..... | ..... | ..... | 10.10 | ..... | 15.35 |
| Lackawanna *B3* | 5.75 | 6.725 | 7.25 | ..... | 6.875 | ..... |
| Lebanon *B3* | ..... | ..... | 7.25 | ..... | ..... | 15.35 |
| Minnequa *C6* | 5.75 | 7.225 | 7.25 | 10.10 | 6.875 | 15.35 |
| Pittsburgh *P5* | ..... | ..... | ..... | ..... | ..... | 14.75 |
| Pittsburgh *J3* | ..... | ..... | ..... | 10.10 | ..... | ..... |
| Seattle *B2* | ..... | ..... | ..... | ..... | 6.75 | 15.85 |
| Steelton *B3* | 5.75 | ..... | 7.25 | ..... | 6.875 | ..... |
| Struthers *Y1* | ..... | ..... | ..... | 10.10 | ..... | ..... |
| Torrance *C7* | ..... | ..... | ..... | ..... | 6.75 | ..... |
| Williamsport *S5* | ..... | 6.725 | ..... | ..... | ..... | ..... |
| Youngstown *R3* | ..... | ..... | ..... | 10.10 | ..... | ..... |

## COKE

| | Net-Ton |
|---|---|
| Furnace, beehive (f.o.b.) Connellsville, Pa. | $14.50 to $15.50 |
| Foundry, beehive (f.o.b.) | $18.50 |
| Foundry oven coke | |
| Buffalo, del'd | $33.25 |
| Detroit f.o.b. | 32.00 |
| New England, del'd | 33.55 |
| New Haven, f.o.b. | 31.00 |
| Kearney, N. J., f.o.b. | 31.25 |
| Philadelphia, f.o.b. | 31.00 |
| Swedeland, Pa., f.o.b. | 31.00 |
| Painesville, Ohio, f.o.b. | 34.35 |
| Erie, Pa., f.o.b. | 32.00 |
| Cleveland, del'd | 34.19 |
| Cincinnati, del'd | 32.84 |
| St. Paul, f.o.b. | 31.25 |
| St. Louis, f.o.b. | 33.00 |
| Birmingham, f.o.b. | 30.35 |
| Milwaukee, f.o.b. | 32.00 |
| Neville Is., Pa. | 30.75 |

## LAKE SUPERIOR ORES

*51.50% Fe natural content, delivered lower Lake ports. Prices for 1959 season. Freight changes for seller's account.*

| | Gross Ton |
|---|---|
| Openhearth lump | $12.70 |
| Old range, bessemer | 11.85 |
| Old range, nonbessemer | 11.70 |
| Mesabi, bessemer | 11.60 |
| Mesabi, nonbessemer | 11.45 |
| High phosphorus | 11.45 |

## ELECTRICAL SHEETS

| 22-Gage F.o.b. Mill Cents Per Lb | Hot-Rolled (Cut Lengths)* | Cold-Reduced (Coiled or Cut Length) Semi-Processed | Cold-Reduced (Coiled or Cut Length) Fully Processed |
|---|---|---|---|
| Field | ..... | 9.875 | ..... |
| Armature | 11.70 | 11.20 | 11.70 |
| Elect. | 12.40 | 11.90 | 12.40 |
| Special Motor | ..... | 12.475 | ..... |
| Motor | 13.55 | 13.05 | 13.55 |
| Dynamo | 14.65 | 14.15 | 14.65 |
| Trans. 72 | 15.70 | 15.20 | 15.70 |
| Trans. 65 | 16.30 | Grain Oriented | |
| Trans. 58 | 16.80 | Trans. 80 | 19.70 |
| Trans. 52 | 17.85 | Trans. 73 | 20.20 |
| | | Trans. 66 | 20.70 |

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S1*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

## ELECTRODES

*Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.*

| GRAPHITE Diam. (In.) | GRAPHITE Length (In.) | GRAPHITE Price | CARBON* Diam. (In.) | CARBON* Length (In.) | CARBON* Price |
|---|---|---|---|---|---|
| 24 | 84 | 27.25 | 40 | 100,110 | 12.50 |
| 20 | 72 | 26.50 | 35 | 110 | 11.20 |
| 18 | 72 | 27.50 | 30 | 110 | 11.70 |
| 14 | 72 | 27.25 | 24 | 72 | 11.95 |
| 12 | 72 | 28.25 | 20 | 90 | 11.55 |
| 10 | 60 | 29.50 | 17 | 72 | 12.10 |
| 10 | 48 | 30.00 | 14 | 72 | 12.55 |
| 7 | 60 | 29.75 | 10 | 60 | 13.80 |
| 6 | 60 | 33.25 | 8 | 60 | 14.25 |
| 4 | 40 | 37.00 | | | |
| 3 | 40 | 39.25 | | | |
| 2½ | 30 | 41.50 | | | |
| 2 | 24 | 64.00 | | | |

* Prices shown cover carbon nipples.

## REFRACTORIES

### Fire Clay Brick

*Carloads per 1000*

| | |
|---|---|
| Super duty, Mo., Pa., Md., Ky. | $185.00 |
| High duty (except Salina, Pa., add $5.00) | 140.00 |
| Medium duty | 125.00 |
| Low duty (except Salina, Pa., add $2.00) | 103.00 |
| Ground fire clay, net ton, bulk | 22.50 |

### Silica Brick

| | |
|---|---|
| Mt. Union, Pa., Ensley, Ala. | $158.00 |
| Childs, Hays, Latrobe, Pa. | 163.00 |
| Chicago District | 168.00 |
| Western Utah | 183.00 |
| California | 165.00 |
| Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville | 163.00-168.00 |
| Silica cement, net ton, bulk, Latrobe | 29.75 |
| Silica cement, net ton, bulk, Chicago | 26.75 |
| Silica cement, net ton, bulk, Ensley, Ala. | 27.75 |
| Silica cement, net ton, bulk, Mt. Union | 25.75 |
| Silica cement, net ton, bulk, Utah and Calif. | 39.00 |

### Chrome Brick

*Per net ton*

| | |
|---|---|
| Standard chemically bonded, Balt. | $109.00 |
| Standard chemically bonded, Curtiner, Calif. | 119.00 |
| Burned, Balt. | 103.00 |

### Magnesite Brick

| | |
|---|---|
| Standard, Baltimore | $140.00 |
| Chemically bonded, Baltimore | 119.00 |

### Grain Magnesite

St. ⅜ to ½-in. grains

| | |
|---|---|
| Domestic, f.o.b. Baltimore in bulk. | $73.00 |
| Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk | 46.00 |
| in sacks | 52.00-54.00 |

### Dead Burned Dolomite

*Per net ton*

| | |
|---|---|
| F.o.b. bulk, producing points in: Pa., W. Va., Ohio | $16.75 |
| Missouri Valley | 15.60 |
| Midwest | 17.00 |

(Effective April 6, 1959)

## MERCHANT WIRE PRODUCTS

| F.o.b. Mill | Standard Q Coated Nails Col | Woven Wire Fence Col | "T" Fence Posts Col | Single Loop Bale Ties Col | Galv. Barbed and Twisted Barbless Wire Col | Merch. Wire Ann'ld ¢/lb. | Merch. Wire Galv. ¢/lb. |
|---|---|---|---|---|---|---|---|
| Alabama City *R3* | 173 | 187 | ... | 212 | 193 | 9.00 | 9.55 |
| Aliquippa *J3*** | 173 | 190 | ... | ... | 190 | 9.00 | 9.675 |
| Atlanta *A8*** | 175 | 192 | ... | 214 | 198 | 8.75 | 9.425 |
| Bartonville *K2*** | 175 | 192 | 178 | 214 | 198 | 9.10 | 9.775 |
| Buffalo *W6* | ..... | ..... | ..... | ..... | ..... | 9.00 | 9.55* |
| Chicago *N4*** | 177 | 190 | 172 | 212 | 196 | 9.00 | 9.70 |
| Chicago *R3* | ..... | ..... | ..... | ..... | ..... | 9.00 | 9.55 |
| Cleveland *A6* | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Cleveland *A5* | ..... | ..... | ..... | ..... | ..... | 9.00 | ..... |
| Crawf'dsv. *M4*** | 175 | 192 | ... | 214 | 198 | 9.10 | 9.775 |
| Donora, Pa. *A5* | 173 | 187 | ... | 212 | 193 | 9.00 | 9.55 |
| Duluth *A5* | 173 | 187 | ... | 212 | 193 | 9.00 | 9.55 |
| Fairfield, Ala. *T2* | 173 | 187 | ... | 212 | 193 | 9.00 | 9.55 |
| Galveston *D4* | 9.10‡ | ..... | ..... | ..... | ..... | ..... | ..... |
| Houston *S2* | 178 | 192 | ... | 217 | 198 | 9.25 | 9.80† |
| Jacksonville *M4* | 184-1 | 197 | ... | 219 | 203 | 9.10 | 9.775 |
| Johnstown *B3*** | 173 | 190 | 171 | ... | 196 | 9.00 | 9.675 |
| Joliet, Ill. *A5* | 173 | 187 | ... | 212 | 193 | 9.00 | 9.55 |
| Kokomo *C9* | 175 | 189 | ... | 214 | 195* | 9.10 | 9.65* |
| L. Angeles *B2**** | ..... | ..... | ..... | ..... | ..... | 9.95 | 10.625 |
| Kansas City *S2** | 178 | 192 | ... | 217 | 198* | 9.25 | 9.80† |
| Minnequa *C6* | 178 | 192 | 182 | 217 | 198† | 9.25 | 9.80† |
| Monessen *P6* | ..... | ..... | ..... | ..... | 193 | 8.65 | 9.325 |
| Palmer, Mass. *W6* | ..... | ..... | ..... | ..... | ..... | 9.30 | 9.85* |
| Pittsburg, Cal. *C7* | 192 | 210 | ..... | ..... | 213 | 9.60 | 10.15 |
| Rankin, Pa. *A5* | 173 | 187 | ..... | ..... | 193 | 9.00 | 9.55 |
| So. Chicago *R3* | 173 | 187 | ..... | ..... | 193 | 8.65 | 9.20 |
| S. San Fran. *C6* | ..... | ..... | ..... | 236 | ..... | 9.95 | 10.50† |
| Sparrows Pt. *B3*** | 175 | ..... | ..... | 214 | 198 | 9.10 | 9.775 |
| Struthers, O. *Y1** | ..... | ..... | ..... | ..... | ..... | 8.65 | 9.20 |
| Worcester *A5* | 179 | ..... | ..... | ..... | ..... | 9.30 | 9.85 |
| Williamsport *S5* | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

* Zinc less than .10¢. *** .10¢ zinc.
** 11-12¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

## C-R SPRING STEEL

| Cents Per Lb F.o.b. Mill | CARBON CONTENT 0.26-0.40 | 0.41-0.60 | 0.61-0.80 | 0.81-1.05 | 1.06-1.35 |
|---|---|---|---|---|---|
| Anderson, Ind. *G4* | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Baltimore, Md. *T8* | 9.50 | 10.70 | 12.90 | 15.90 | 18.85 |
| Bristol, Conn. *W12* | ..... | 10.70 | 12.90 | 16.10 | 19.30 |
| Boston *T8* | 9.50 | 10.70 | 12.90 | 15.90 | 18.85 |
| Buffalo, N. Y. *R7* | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Carnegie, Pa. *S9* | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Cleveland *A5* | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Dearborn *S1* | 9.05 | 10.50 | 12.70 | ..... | ..... |
| Detroit *D1* | 9.05 | 10.50 | 12.70 | 15.70 | ..... |
| Detroit *D2* | 9.05 | 10.50 | 12.70 | ..... | ..... |
| Dover, O. *G4* | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Evanston, Ill. *M8* | 9.05 | 10.40 | 12.60 | ..... | ..... |
| Franklin Park, Ill. *T8* | 9.05 | 10.40 | 12.60 | 15.60 | 18.55 |
| Harrison, N. J. *C11* | ..... | ..... | 12.90 | 16.10 | 19.30 |
| Indianapolis *R5* | 9.10 | 10.55 | 12.60 | 15.60 | 18.55 |
| Los Angeles *C7* | 11.15 | 12.60 | 14.80 | 17.80 | ..... |
| New Britain, Conn. *S7* | 9.40 | 10.70 | 12.90 | 15.90 | 18.85 |
| New Castle, Pa. *B4* | 8.95 | 10.40 | 12.60 | 15.60 | ..... |
| New Haven, Conn. *D1* | 9.40 | 10.70 | 12.90 | 15.90 | ..... |
| Pawtucket, R. I. *N7* | 9.50 | 10.70 | 12.90 | 15.90 | 18.85 |
| Riverdale, Ill. *A1* | 9.05 | 10.40 | 12.60 | 15.60 | 18.55 |
| Sharon, Pa. *S1* | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Trenton, *R4* | ..... | 10.70 | 12.90 | 16.10 | 19.30 |
| Wallingford *W1* | 9.40 | 10.70 | 12.90 | 15.90 | 18.55 |
| Warren, Ohio *T4* | 8.95 | 10.40 | 12.60 | 15.60 | 18.75 |
| Worcester, Mass. *A5* | 9.50 | 10.70 | 12.90 | 15.90 | 18.85 |
| Youngstown *R5* | 9.10 | 10.55 | 12.60 | 15.60 | 18.55 |

## BOILER TUBES

| $ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill | Size OD-In. | Size B.W. Ga. | Seamless H.R. | Seamless C.D. | Elec. Weld H.R. |
|---|---|---|---|---|---|
| Babcock & Wilcox | 2 | 13 | 40.28 | 47.21 | 35.22 |
| | 2½ | 12 | 54.23 | 63.57 | 47.43 |
| | 3 | 12 | 62.62 | 73.40 | 54.77 |
| | 3½ | 11 | 73.11 | 85.70 | 63.93 |
| | 4 | 10 | 97.08 | 113.80 | 85.53 |
| National Tube | 2 | 13 | 40.28 | 47.21 | 35.22 |
| | 2½ | 12 | 54.23 | 63.57 | 47.43 |
| | 3 | 12 | 62.62 | 73.40 | 54.77 |
| | 3½ | 11 | 73.11 | 85.70 | 63.93 |
| | 4 | 10 | 97.08 | 113.80 | 85.53 |
| Pittsburgh Steel | 2 | 13 | 40.28 | 47.21 | ..... |
| | 2½ | 12 | 54.23 | 63.57 | ..... |
| | 3 | 12 | 62.62 | 73.40 | ..... |
| | 3½ | 11 | 73.11 | 85.70 | ..... |
| | 4 | 10 | 97.08 | 113.80 | ..... |

## METAL POWDERS

*Cents per lb, minimum truckload, delivered E. of Miss. River, unless otherwise noted.*

### Iron Powders

Compacting Powders

| | |
|---|---|
| Electrolytic, imported, f.o.b. | 29.50 to 33.00 |
| Electrolytic, domestic | 34.50 |
| Sponge | 11.25 |
| Atomized | 11.25 |
| Hydrogen Reduced | 11.25 to 12.00 |
| Carbonyl | 88.00 |
| Welding Powders* | 8.10 |
| Cutting and Scarfing Powders* | 9.10 |

### Copper Powders

| | |
|---|---|
| Electrolytic, domestic | 41.00 |
| Precipitated | 40.50 to 45.00 |
| Atomized | 39.80 to 48.30 |
| Hydrogen reduced, f.o.b. | 43.25 |
| Bronze | 47.20 to 51.50 |
| Chromium, electrolytic | $5.00 |
| Lead | 19.00 |
| Manganese, f.o.b. | 42.00 |
| Molybdenum | $3.60 to $3.95 |
| Nickel | $1.05 to $1.03 |
| Nickel Silver | 53.50 |
| Nickel Steel | 13.00 |
| Solder | 13¢ plus metal value |
| Stainless Steel, 302 | $1.07 |
| Stainless Steel, 316 | $1.26 |
| Steel, atomized, prealloyed, 4600 series | 14.00 plus metal value |
| Tin | 14¢ plus metal value |
| Titanium, 99.25+%, per lb., f.o.b. | $11.25 |
| Tungsten | $3.15 (nominal) |

* F.O.B., shipping point.

## BOLTS, NUTS, RIVETS, SCREWS

*(Base discount, f.o.b. mill)*

*Pct. Discounts*

| Bolts | 1-4 Containers | 5 Containers | 20,000 Lb. | 40,000 Lb. |
|---|---|---|---|---|
| Machine ½" and smaller x 3" and shorter | 55 | 57 | 61 | 62 |
| ⅝" diam. x 3" and shorter | 47 | 49½ | 54 | 55 |
| ¾" thru 1" diam x 6" and shorter | 37 | 39½ | 45 | 46 |
| ¾" thru 1" diam. longer than 6" and 1¼" and larger x all lengths | 31 | 34 | 40 | 41 |
| Rolled thread, ½" and smaller x 3" and shorter | 55 | 57 | 61 | 62 |
| Carriage, lag, plow, tap, blank, step, elevator and fitting up bolts ½" and smaller x 6" and shorter | 48 | 50½ | 55 | 56 |

Note: Add 25 pct for less than container quantity. Distributor prices are 5 pct less on bolts and square nuts.

| Nuts, Hex, HP reg. & hvy. | Full case or Keg price |
|---|---|
| ¾ in. or smaller | 62 |
| ⅞ in. to 1½ in. inclusive | 56 |
| 1⅝ in. and larger | 51½ |

### C. P. Hex, reg. & hvy.

| | |
|---|---|
| ¾ in. or smaller | 62 |
| ⅞ in. to 1½ in. inclusive | 56 |
| 1⅝ in. and larger | 51½ |

### Hot Galv. Hex Nuts (All Types)

| | |
|---|---|
| ¾ in. and smaller | 41 |

### Semi-finished Hex Nuts

| | |
|---|---|
| ¾ in. or smaller | 62 |
| ⅞ in. to 1½ in. inclusive | 56 |
| 1⅝ in. and larger | 51½ |

*(Add 25 pct for broken case or keg quantities)*

### Finished

| | |
|---|---|
| ⅞ in. and smaller | 65 |

| Rivets | *Base per 100 lb* |
|---|---|
| ½ in. and larger | $12.85 |
| | *Pct. Off List* |
| 7/16 in. and smaller | 15 |

| Cap Screws | *Discount (Packages)* |
|---|---|
| | *Full Finished H. C. Heat Treat* |
| New std. hex head, packaged | Full Case |
| ⅝" diam. and smaller x 6" and shorter | 54 | 42 |
| ¾", ⅞", and 1" diam. x 6" and shorter | 38 | 23 |
| ⅝" diam. and smaller x longer than 6" | .. | .. |
| ¾", ⅞", and 1" diam. x longer than 6" | .. | .. |

| | C-1018 Steel Full-Finished Cartons | Bulk |
|---|---|---|
| ¼" through ⅝" dia. x 6" and shorter | 59 | 48 |
| ¾" through 1" dia. x 6" and shorter | 45 | 32 |

Minimum quantity—¼" through ⅝" diam., 15,000 pieces; 7/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

### Machine Screws & Stove Bolts

| | Discount Mach. Screws | Stove Bolts |
|---|---|---|
| Plain Finish Cartons | 60 | 60 |
| Bulk | | |
| *Quantity* | | |
| To ¼" diam. incl. — 25,000-and over | 60 | .. |
| 5/16 to ½" diam. incl. — 15,000-200,000 | 60 | .. |

### Machine Screws & Stove Bolt Nuts

| | Discount Hex | Square |
|---|---|---|
| In Cartons | 16 | 19 |
| *Quantity* | | |
| In Bulk | | |
| ⅜" diam. & smaller — 25,000-and over | 15 | 16 |

## ELECTROPLATING SUPPLIES

### Anodes

*(Cents per lb, frt allowed in quantity)*

| | |
|---|---|
| Copper | |
| Rolled elliptical, 18 in. or longer, 5000 lb lots | 44.50 |
| Electrodeposited | 37.50 |
| Brass, 80-20, ball anodes, 2000 lb or more | 47.50 |
| Zinc, ball anodes, 2000 lb lots | 18.00 |
| (for elliptical add 1¢ per lb) | |
| Nickel, 99 pct plus, rolled carton, 5000 lb | 1.0225 |
| (Rolled depolarized add 3¢ per lb) | |
| Cadmium | 1.45 |
| Tin, ball anodes $1.05 per lb (approx.). | |

### Chemicals

*(Cents per lb, f.o.b. shipping point)*

| | |
|---|---|
| Copper cyanide, 100 lb drum | 65.90 |
| Copper sulphate, 100 lb bags, per cwt. | 22.75 |
| Nickel salts, single, 100 lb bags | 36.00 |
| Nickel chloride, freight allowed, 100 lb | 45.00 |
| Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums | 23.70 |
| (Philadelphia price 24.00) | |
| Zinc cyanide, 100 lb | 60.75 |
| Potassium cyanide, 100 lb drum N. Y. | 45.50 |
| Chromic acid, flake type, 10,000 lb or more | 30.44 |

## CAST IRON WATER PIPE INDEX

| | |
|---|---|
| Birmingham | 125.8 |
| New York | 138.5 |
| Chicago | 140.9 |
| San Francisco-L. A. | 148.6 |

*Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.*

## STEEL SERVICE CENTERS

Metropolitan Price, dollars per 100 lb.

| Cities | City Delivery‡ Charge | Sheets: Hot-Rolled (18 ga. & hvr.) | Sheets: Cold-Rolled (15 gage) | Sheets: Galvanized (10 gage)†† | Strip: Hot-Rolled | Plates | Shapes: Standard Structural | Bars: Hot-Rolled (merchant) | Bars: Cold-Finished | Alloy Bars: Hot-Rolled 4615 As rolled | Alloy Bars: Hot-Rolled 4140 Annealed | Alloy Bars: Cold-Drawn 4615 As rolled | Alloy Bars: Cold-Drawn 4140 Annealed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Atlanta | | 8.59 | 9.87 | 10.13 | 8.91 | 9.29 | 9.40 | 9.39 | 13.24* | ..... | ..... | ..... | ..... |
| Baltimore | $.10 | 8.65 | 9.35 | 9.09 | 9.15 | 9.10 | 9.65 | 9.55 | 11.80* | 16.28 | 15.28 | 19.82 | 19.08 |
| Birmingham | | 8.18 | 9.45 | 10.46 | 8.51 | 8.89 | 9.00 | 8.99 | ..... | ..... | ..... | ..... | ..... |
| Boston | .10 | 10.22 | 10.50 | 12.07 | 11.27 | 10.42 | 10.79 | 10.34 | 13.45* | 16.79 | 15.79 | 20.29 | 19.54 |
| Buffalo | .15 | 8.55 | 9.75 | 11.00 | 8.90 | 9.35 | 9.40 | 9.30 | 11.60* | 16.34 | 15.55 | 19.01 | 19.30 |
| Chicago | .15 | 8.40 | 9.60 | 11.05 | 8.66 | 9.04 | 9.15 | 9.14 | 9.30 | 16.20 | 15.20 | 19.70 | 18.95 |
| Cincinnati | .15 | 8.58 | 9.65 | 11.10 | 8.98 | 9.42 | 9.71 | 9.46 | 11.68* | 16.52 | 15.52 | 20.02 | 19.27 |
| Cleveland | .15 | 8.51 | 9.69 | 11.15 | 8.78 | 9.28 | 9.54 | 9.25 | 11.40* | 16.31 | 15.31 | 19.81 | 19.06 |
| Denver | .20 | 9.60 | 11.84 | 12.94 | 9.63 | 9.96 | 10.04 | 10.00 | 11.19 | ..... | ..... | ..... | 20.84 |
| Detroit | .15 | 8.66 | 9.85 | 11.40 | 9.03 | 9.41 | 9.71 | 9.45 | 9.66 | 15.46 | 15.48 | 18.81 | 19.23 |
| Houston | | 8.10 | 8.60 | ..... | 8.15 | 8.45 | 8.05 | 8.10 | 11.60 | 16.20 | 15.25 | 19.65 | 18.95 |
| Kansas City | .15 | 9.02 | 10.27 | 11.37 | 9.33 | 9.71 | 9.82 | 9.81 | 10.22 | 16.87 | 15.87 | 20.37 | 19.62 |
| Los Angeles | | 8.70[5] | 11.20-11.80 | 12.20 | 9.15 | 9.10 | 9.00 | 9.10 | 12.95 | 17.30 | 16.35 | 21.30 | 20.60 |
| Memphis | .15 | 8.55 | 9.80 | ..... | 8.60 | 8.93 | 9.01 | 8.97 | 12.11* | ..... | ..... | ..... | ..... |
| Milwaukee | .15 | 8.54 | 9.73 | 11.19 | 8.80 | 9.18 | 9.37 | 9.28 | 9.54 | 16.34 | 15.34 | 19.84 | 19.09 |
| New York | .10 | 9.27 | 10.59 | 11.40 | 9.74 | 9.87 | 9.84 | 10.09 | 13.35* | 16.16 | 15.60 | 20.10 | 19.35 |
| Norfolk | .20 | 8.20 | ..... | ..... | 8.90 | 8.65 | 9.20 | 8.90 | 10.70 | ..... | ..... | ..... | ..... |
| Philadelphia | .10 | 8.30 | 9.35 | 10.71 | 9.35 | 9.25 | 9.20 | 9.50 | 12.05* | 16.58 | 15.58 | 20.08 | 19.33 |
| Pittsburgh | .15 | 8.50-8.60 | 9.70-9.95 | 11.05 | 8.76 | 9.05 | 9.15 | 9.14 | 11.40* | 16.20 | 15.20 | 19.70 | 18.95 |
| Portland | | 10.00[1] | 11.75[2] | 13.30[3] | 11.95[4] | 11.50[5] | 11.10[6] | 9.85[7] | 15.30* | 18.50 | 17.45 | 20.75 | 20.25 |
| San Francisco | .10 | 9.75 | 11.20[9] | 11.50 | 9.85 | 10.10 | 9.95 | 10.25 | 13.70 | 17.05 | 16.35 | 21.05 | 20.60 |
| Seattle | | 10.30 | 11.55 | 12.50 | 10.25 | 10.10 | 10.20 | 10.50 | 14.70 | 17.15 | 16.80 | 20.65 | 20.60 |
| Spokane | .15 | 10.45 | 11.70 | 12.65 | 10.65 | 10.25 | 10.35 | 11.15 | 14.85 | 17.75 | 16.95 | 21.55 | 20.75 |
| St. Louis | .15 | 8.78 | 9.98 | 11.43 | 9.04 | 9.42 | 9.63 | 9.52 | 9.93 | 16.58 | 15.58 | 20.08 | 19.33 |
| St. Paul | .15 | 8.94 | 10.19 | 11.64 | 8.99 | 9.45 | 9.53 | 9.70[7] | 10.16 | ..... | 15.41 | ..... | 19.21 |

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **All sizes except 18 and 16 gage.

†† 10¢ zinc. ‡ Deduct for country delivery. * C1018—1 in. rounds. [1] 10 ga. x 36" x 120"; [2] 20 ga. x 36" x 120"; [3] 26 gn. x 30" x 96"; [4] 4½" x 1" in lots of 1000 to 9999; [5] sheared plate ¼" x 84" in lots of 1000 to 9999; [6] 3" x 5.70" in lots of 1000 to 9999; [7] M-1020—1-in. rounds in lots of 1000 to 9999; [9] 15 ga. & heavier; [9] 14 ga. & lighter.

(Effective April 6, 1959)

*** Stainless Steel welding information:**

# *Keep it clean

**You get strong, tight joints** when you weld Stainless Steel, but you have to make sure the surfaces have been thoroughly cleaned. Any grease, oil or dirt on the welded surface might affect the corrosion resistance of Stainless.

When you want to repair a crack, it's a good idea to chip out the cracked area completely so you're sure that only clean, solid metal is exposed. And remember, there are a lot of different kinds of Stainless Steel and they don't all react the same way. Be sure you handle each job right—check the "Stainless Steel Fabrication Book" before you start. If you don't have a copy of this 130-page guide, write on your company letterhead to United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

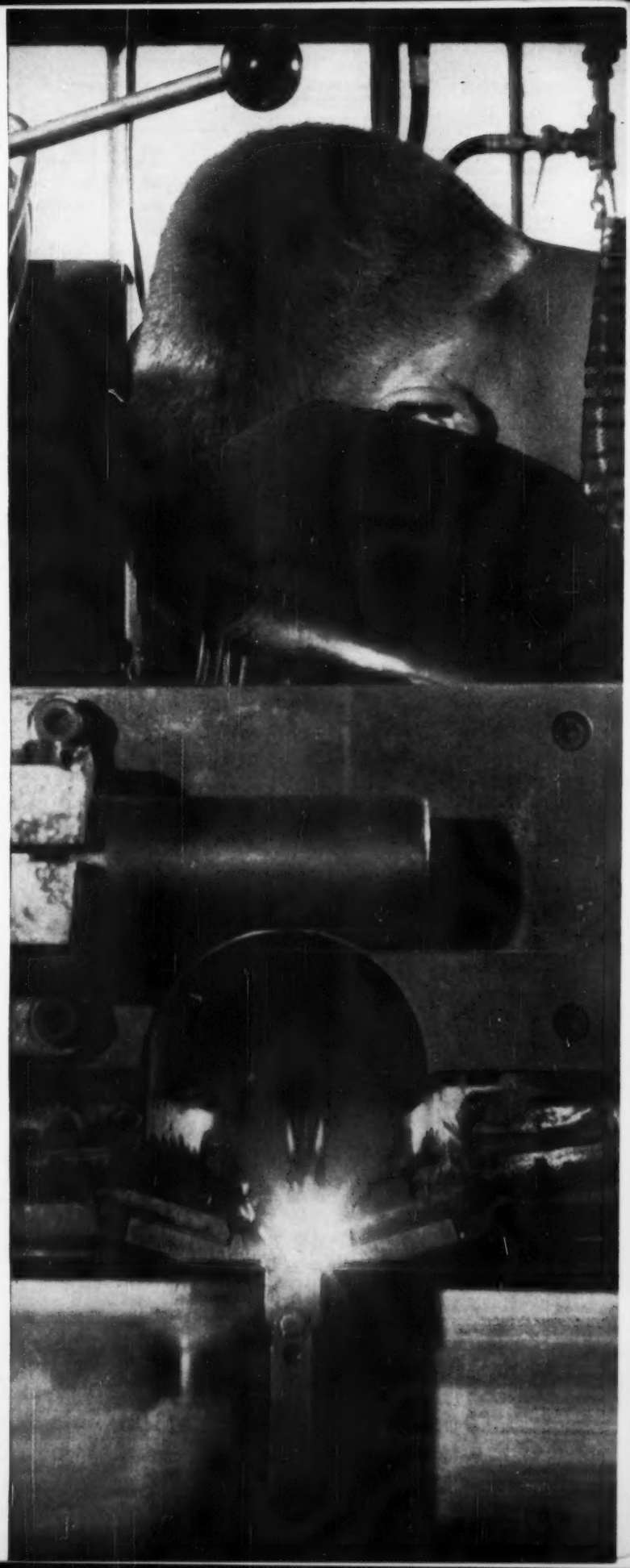
USS Stainless Steel is available through your USS representative or your local steel service center.

*USS is a registered trademark*

United States Steel Corporation—Pittsburgh
American Steel & Wire—Cleveland
National Tube—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Warehouse Distributors
United States Steel Export Company

**United States Steel**

USS



## PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

| Producing Point | Basic | Fdry. | Mall. | Bess. | Low Phos. |
|---|---|---|---|---|---|
| Birdsboro, Pa. *B6* | 68.00 | 68.50 | 69.00 | 69.50 | ..... |
| Birmingham *R3* | 62.00 | 62.50* | ..... | ..... | ..... |
| Birmingham *W9* | 62.00 | 62.50* | 66.50 | ..... | ..... |
| Birmingham *U4* | 62.00 | 62.50* | 66.50 | ..... | ..... |
| Buffalo *R3* | 66.00 | 66.50 | 67.00 | 67.50 | ..... |
| Buffalo *H1* | 66.00 | 66.50 | 67.00 | 67.50 | ..... |
| Buffalo *W6* | 66.00 | 66.50 | 67.00 | 67.50 | ..... |
| Chester *P2* | 66.50 | 67.00 | 67.50 | ..... | ..... |
| Chicago *I4* | 66.00 | 66.50 | 66.50 | 67.00 | ..... |
| Cleveland *A5* | 66.00 | 66.50 | 66.50 | 67.00 | 71.00† |
| Cleveland *R3* | 66.00 | 66.50 | 66.50 | 67.00 | ..... |
| Duluth *I4* | 66.00 | 66.50 | 66.50 | 67.00 | 71.00† |
| Erie *I4* | 66.00 | 66.50 | 66.50 | 67.00 | 71.00† |
| Everett *M6* | 67.50 | 68.00 | 68.50 | ..... | ..... |
| Fontana *K1* | 75.00 | 75.50 | ..... | ..... | ..... |
| Geneva, Utah *C7* | 66.00 | 66.50 | ..... | ..... | ..... |
| Granite City *G2* | 67.90 | 68.40 | 68.90 | ..... | ..... |
| Hubbard *Y1* | ..... | ..... | 66.50 | ..... | ..... |
| Ironton, Utah *C7* | 66.00 | 66.50 | ..... | ..... | ..... |
| Midland *C11* | 66.00 | ..... | ..... | ..... | ..... |
| Minnequa *C6* | 68.00 | 68.50 | 69.00 | ..... | ..... |
| Monessen *P6* | 66.00 | ..... | ..... | ..... | ..... |
| Neville Is. *P4* | 66.00 | 66.50 | 66.50 | 67.00 | 71.00† |
| N. Tonawanda *T1* | ..... | 66.50 | 67.00 | 67.50 | ..... |
| Sharpsville *S3* | 66.00 | ..... | 66.50 | 67.00 | ..... |
| So. Chicago *R3* | 66.00 | 66.50 | 66.50 | 67.00 | ..... |
| So. Chicago *W8* | 66.00 | ..... | 66.50 | 67.00 | ..... |
| Swedeland *A2* | 68.00 | 68.50 | 69.00 | 69.50 | ..... |
| Toledo *I4* | 66.00 | 66.50 | 66.50 | 67.00 | ..... |
| Troy, N. Y. *R3* | 68.00 | 68.50 | 69.00 | 69.50 | 73.00 |
| Youngstown *Y1* | ..... | ..... | 66.50 | ..... | ..... |

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.); $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

## STAINLESS STEEL

Base price cents per lb. f.o.b. mill

| Product | 201 | 202 | 301 | 302 | 303 | 304 | 316 | 321 | 347 | 403 | 410 | 416 | 430 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ingots, reroll. | 22.75 | 24.75 | 24.00 | 26.25 | — | 28.00 | 41.25 | 33.50 | 38.50 | — | 17.50 | — | 17.75 |
| Slabs, billets | 28.00 | 31.50 | 29.00 | 32.75 | 33.25 | 34.50 | 51.25 | 41.50 | 48.25 | — | 22.25 | — | 22.50 |
| Billets, forging | — | 37.75 | 38.75 | 39.50 | 42.50 | 42.00 | 64.50 | 48.75 | 57.75 | 29.25 | 29.25 | 29.75 | 29.75 |
| Bars, struct. | 43.50 | 44.50 | 46.00 | 46.75 | 49.75 | 49.50 | 75.75 | 57.50 | 67.25 | 35.00 | 35.00 | 35.50 | 35.50 |
| Plates | 39.25 | 40.00 | 41.25 | 42.25 | 45.00 | 45.75 | 71.75 | 54.75 | 64.75 | 30.00 | 30.00 | 31.25-31.75 | 31.00 |
| Sheets | 48.50 | 49.25 | 51.25 | 52.00 | 56.75 | 55.00 | 80.75 | 65.50 | 79.25 | 40.25 | 40.25 | 48.25 | 40.75 |
| Strip, hot-rolled | 36.00 | 39.00 | 37.25 | 40.50 | — | 44.25 | 69.25 | 53.50 | 63.50 | — | 31.00 | — | 32.00 |
| Strip, cold-rolled | 45.00 | 49.25 | 47.50 | 52.00 | 56.75 | 55.00 | 80.75 | 65.50 | 79.25 | 40.25 | 40.25 | 42.50 | 40.75 |
| Wire CF; Rod HR | — | 42.25 | 43.50 | 44.25 | 47.25 | 47.00 | 71.75 | 54.50 | 63.75 | 33.25 | 33.25 | 33.75 | 33.75 |

STAINLESS STEEL PRODUCING POINTS:

*Sheets:* Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Detroit, *M2*; Louisville, O., *R5*.

*Strip:* Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Detroit, *S1*; Canton, Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *R5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13*, (25¢ per lb. higher); New Bedford, Mass., *R6*; Gary, *U1*, (25¢ per lb. higher).

*Bar:* Baltimore, *A7*; S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R5*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*, *R3*; Ft. Wayne, *I4*; Detroit, *R5*; Gary, *U1*; Owensboro, Ky., *G5*; Bridgeport, Conn., *N8*.

*Wire:* Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *I4*; Newark, N. J. *D2*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*; Detroit, *R5*.

*Structurals:* Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

*Plates:* Baltimore, *E1*; Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Vandergrift, Pa., *U1*; Gary, *U1*.

*Forging billets:* Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*; Owensboro, Ky., *G5*; Bridgeport, Conn., *N8*.

(Effective April 6, 1959)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**KUTZTOWN** *Skill*

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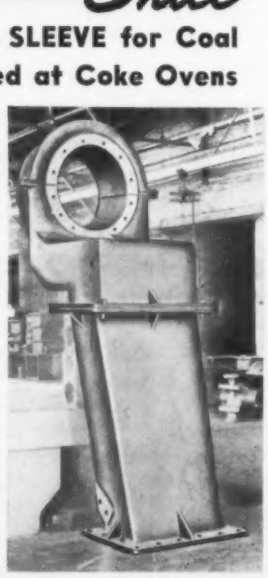
Made of Ductile Iron Grade 60-45-10, this Smoke Sleeve was Dry Sand Molded in three sections, and is shown here assembled for testing.

Weights: top—Half Drop Sleeve, 248 lbs.; center—Half Drop Sleeve, 774 lbs.; bottom—Drop Sleeve, 856 lbs.

The entire job was completely machined by us.

We invite your inquiries . . . We will be happy to further explain dry sand molding as well as the other methods in regular use so that you will be able to select the best and most economical way to make the castings you need. Drop us a line or call OVerbrook 3-7151.



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# FERROALLOY PRICES

### Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

| | | | |
|---|---|---|---|
| 0.02% C.... | 41.00 | 0.50% C.... | 38.00 |
| 0.05% C.... | 39.00 | 1.00% C.... | 37.75 |
| 0.10% C.... | 38.50 | 1.50% C.... | 37.50 |
| 0.20% C.... | 38.25 | 2.00% C.... | 37.25 |

4.00-4.50% C, 60-70% Cr, 1-2% Si.. 28.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si ..... 28.25
0.025% C (Simplex) ..... 36.75
8% max C, 50-55% Cr, 6% max Si. 25.75
4½% max C, 50-55% Cr, 2% max Si ..... 26.50

### High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

### Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97.25% min. Cr, 1% max. Fe.
0.10% max. C ..... $1.29
9 to 11% C, 88-91% Cr, 0.75% Fe... 1.38

### Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.
Carloads ..... $1.15
Ton lots ..... 1.17
Less ton lots ..... 1.19

### Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.)
Carloads, delivered, lump, 3-in. x down, packed.
Price is sum of contained Cr and contained Si.

| | Cr | Si |
|---|---|---|
| Carloads, bulk ..... | 28.25 | 14.60 |
| Ton lots ..... | 33.50 | 16.05 |
| Less ton lots ..... | 35.10 | 17.70 |

### Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.
Carloads, bulk ..... 24.00
Ton lots ..... 27.95
Less ton lots ..... 29.45

### Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.
Carloads, bulk ..... 23.00
Ton lots ..... 26.15
Less ton lots ..... 27.15

### SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.
Ton lots ..... 21.15
Less ton lots ..... 22.40

### V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.
Carload lots ..... 18.45
Ton lots ..... 19.95
Less ton lots ..... 21.20

### Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.
Carload packed ..... 19.20
Ton lots to carload packed ..... 21.15
Less ton lots ..... 22.40

### Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

| Producing Point | Cents per-lb |
|---|---|
| Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore. ..... | 12.25 |
| Johnstown, Pa. ..... | 12.25 |
| Neville Island, Pa. ..... | 12.25 |
| Sheridan, Pa. ..... | 12.25 |
| Philo, Ohio ..... | 12.25 |
| S. Duquesne ..... | 12.25 |

Add or substract 0.1¢ for each 1 pct Mn above or below base content.
Briquets, delivered, 66 pct Mn:
Carloads, bulk ..... 14.80
Ton lots packed in bags ..... 17.20

### Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.

| Manganese | Silicon | |
|---|---|---|
| 16 to 19% | 3% max. ..... | $100.50 |
| 19 to 21% | 3% max. ..... | 102.50 |
| 21 to 23% | 3% max. ..... | 105.00 |

### Manganese Metal

2 in. x down, cents per pound of metal delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.
Carload, packed ..... 45.75
Ton lots ..... 47.25

### Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.
Carloads ..... 34.00
Ton lots ..... 36.00
250 to 1999 lb ..... 38.00
Premium for Hydrogen - removed metal ..... 0.75

### Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn ..... 25.50

### Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.

| | Carloads | Ton | Less |
|---|---|---|---|
| 0.07% max. C, 0.06% P, 90% Mn ..... | (Bulk) 37.15 | 39.95 | 41.15 |
| 0.07% max. C ..... | 35.10 | 37.90 | 39.10 |
| 0.10% max. C ..... | 34.35 | 37.15 | 38.35 |
| 0.15% max. C ..... | 33.60 | 36.40 | 37.60 |
| 0.30% max. C ..... | 32.10 | 34.90 | 36.10 |
| 0.50% max. C ..... | 31.60 | 34.40 | 35.60 |
| 0.75% max. C, 80.85% Mn, 5.0-7.0% Si ... | 28.60 | 31.40 | 32.60 |

### Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.
Carloads bulk ..... 12.80
Ton lots, packed ..... 14.45
Carloads, bulk, delivered, per lb of briquet ..... 15.10
Briquets, packed pallets, 3000 lb up to carloads ..... 16.30

### Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

### Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

| | Ton lots, | Carloads, |
|---|---|---|
| 98.25% Si, 0.50% Fe.. | 24.95 | 23.65 |
| 98% Si, 1.0% Fe .... | 24.45 | 23.15 |

### Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.
Carloads, bulk ..... 8.00
Ton lots, packed ..... 10.80

### Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

| | | | |
|---|---|---|---|
| 50% Si.... | 14.60 | 75% Si.... | 16.90 |
| 65% Si.... | 15.75 | 85% Si.... | 18.60 |
| | 90% Si.... | 20.00 | |

### Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.
Openhearth ..... 3.20
Crucible ..... 3.30
High speed steel ..... 3.40

### Calcium Metal

Eastern zone, cents per pound of metal, delivered.

| | Cast | Turnings | Distilled |
|---|---|---|---|
| Ton lots ..... | $2.05 | $2.95 | $3.75 |
| 100 to 1999 lb.. | 2.40 | 3.30 | 4.55 |

(Effective April 6, 1959)

**Alsifer,** 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.
Carloads, bulk ..... 9.85¢
Ton lots ..... 11.20¢

**Calcium molybdate,** 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo ..... $1.50

**Ferrocolumbium,** 50-60% lb, 2 in. x D, delivered per pound contained Cb.
Ton lots ..... $3.90
Less ton lots..... 3.95

**Ferro-tantalum-columbium,** 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta ..... $3.40

**Ferromolybdenum,** 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.76

**Ferrophosphorus,** electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $5.00 unitage, per gross ton ..... $120.00
10 tons to less carload ..... $131.00

**Ferrotitanium,** 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti ..... $1.35

**Ferrotitanium,** 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti ..... $1.50
Less ton lots ..... $1.54

**Ferrotitanium,** 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton ..... $240.00

**Ferrotungsten,** ¼ x down packed, per pounds contained W, ton lots delivered ..... $2.15 (nominal)

**Molybdic oxide,** briquets per lb contained Mo, f.o.b. Langeloth, Pa. ..... $1.49
bags, f.o.b. Washington, Pa., Langeloth, Pa. ..... $1.38

**Simanal,** 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.
Carload, bulk lump ..... 18.50¢
Ton lots, packed lump ..... 20.50¢
Less ton lots ..... 21.00¢

**Vanadium oxide,** 86-89% $V_2O_5$ per pound contained $V_2O_5$ .... $1.38

**Zirconium silicon,** per lb of alloy 35-40% del'd, carloads, bulk.. 26.25¢
12-15%, del'd lump, bulk-carloads ..... 9.25¢

### Boron Agents

**Borosil,** per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload ..... $5.50

**Bortram,** f.o.b. Niagara Falls.
Ton lots per pound ..... 45¢
Less ton lots, per pound ..... 50¢

**Corbortam,** Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 14.00¢

**Ferroboron,** 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots... $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up
10 to 14% B ..... .85
14 to 19% ..... 1.20
19% min. B ..... 1.50

**Grainal,** f.o.b. Cambridge, O., freight, allowed, 100 lb and over
No. 1 ..... $1.05
No. 79 ..... 50¢

**Manganese-Boron,** 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.
Ton lots (packed) ..... $1.46
Less ton lots (packed) .... 1.57

**Nickel-Boron,** 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots ..... 2.15

**RAILWAY EQUIPMENT**
FOR SALE
Used As-Is Reconditioned
**RAILWAY CARS**
All Types
**SERVICE-TESTED**
**FREIGHT CAR REPAIR PARTS**
For All Types of Cars

**SPECIAL OFFERINGS**
1—30-Ton American Diesel Locomotive Crane
Complete with Generator
New 1948
3—44-Ton, General Electric Diesel-Electric Locomotives
ICC Operating Condition
Standard Gauge

**STANDARD GAUGE CARS**
10 Covered Hopper Cars
70-Ton Capacity
Ore Hopper Cars
660 Cubic Feet
40- and 50-Ton Capacity
**RAILWAY TANK CARS and STORAGE TANKS**
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**REBUILT — GUARANTEED ELECTRICAL EQUIPMENT**

**MOTOR GENERATOR SETS**

| Qu. | K.W. | Make | R.P.M. | Volts D.C. | Volts A.C. |
|---|---|---|---|---|---|
| 3* | 3500 | Al.Ch. | 514 | 350/700 | 13,800/6900 4160 |
| 1 | 2000 | G.E. | 450 | 132/265 | 4160/2400 |
| 2* | 2000 | Whse. | 720 | 600 | 13,800/6900 4158 |
| 2 | 1250 | Whse. | 720 | 558 | 4158/2400 |
| 1 | 1250 | G.E. | 450 | 250 | 4160/2400 |
| 2 | 1000 | Whse. | 720 | 600 | 4160/2400 |
| 2 | 500 | Whse. | 1200 | 125/250 | 4000/2300 |
| 1 | 450 | Whse. | 900 | 280/300 | 2300 |
| 3 | 300 | Whse. | 1200 | 125/250 | 4000/2300 |
| 1* | 300 | Al.Ch. | 1200 | 250/300 | 2300 |
| 3 | 200 | Whse. | 1200 | 125/250 | 2300 |
| 1 | 150 | Whse. | 1200 | 250 | 2300 |
| 1 | 150 | G.E. | 1200 | 250 | 4665/2305 |
| 2 | 150 | Rel. | 1200 | 125 | 2300 |

*—3 Unit Sets.

**SPECIAL,** before removal (1) 1875-K.W. Whse., M.G. Set, Gen. 250-V.D.C., 514 R.P.M. with 2700-H.P. Syn Motor, 13800/6900/4000-V., 3 ph., 60 cy. with Control.

**DIRECT CURRENT MOTORS**

| Qu. | H.P. | Make | Type | Volts | R.P.M. |
|---|---|---|---|---|---|
| 1** | 3000 | G.E. | M.P.C. | 300/600 | 250/380 |
| 2*** | 3000 | Whse. | Rev. | 525/600 | 600 |
| 1** | 2200 | Whse. | Mill | 600 | 92/133 |
| 8** | 1500 | Whse. | Rev. | 525 | 600 |
| 1** | 1250 | Al.Ch. | Mill | 600 | 300/600 |
| 2** | 940 | S.S. | Mill | 600 | 300/1000 |
| 1** | 700 | Whse. | Mill | 600 | 143 |
| 4** | 700 | Whse. | Rev. | 250 | 500/700 |
| 2** | 645 | S.S. | Mill | 300 | 1000 |
| 1 | 600 | Whse. | Mill | 250 | 110/220 |
| 3 | 600 | Al.Ch. | Mill | 600 | 300/600 |
| 1 | 400 | G.E. | M.P.C. | 270 | 450 |
| 1 | 300 | Whse. | Mill | 230 | 300 |
| 2 | 275 | Whse. | Q.M.660.6 | 250 | 425/850 |
| 1 | 175 | G.E. | C.D.175-A | 245 | 800/1025 |
| 1 | 125 | Whse. | SK-184 | 230 | 575/850 |
| 1 | 125 | Whse. | SK-190 | 230 | 450/1000 |
| 1 | 100 | Rel. | 461-T | 250 | 1150/1500 |
| 1 | 100 | Whse. | SK-183 | 230 | 450/1000 |
| 1 | 100 | G.E. | CD-175 | 230 | 400/1200 |
| 1 | 80 | Rel. | 651-T | 230 | 575/1150 |
| 1 | 80 | Bl.Dy. | 25-S | 230 | 525/1050 |
| 1 | 50/60 | Whse. | SK-131 | 230 | 500/1500 |
| 1* | 50 | G.E. | CD-175 | 230 | 400/1200 |
| 2* | 30/40 | Whse. | SK-131 | 230 | 500/1500 |

*—T.E.F.C. **—Enclosed Forced Ventilated.
***—Two Motors in Tandem.

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# Foreign Toolmakers Hurt Export Sales

**Used machinery dealers from the U. S. are losing sales overseas to new foreign-made equipment.**

**Competition comes from Czechoslovakia, Germany, Rumania, and even Red China.**

▪ Low priced foreign machine tools have knocked the props out from under the export market for U. S. dealers. And the situation will get worse before it gets better, according to one of the major used machine companies, Laurens Bros., Cincinnati.

The post-war revival of the industrial power of Germany made it one of the chief rivals for U. S. exports. Germany is selling full lines of new machines for 10-20 pct less than U. S. used tools.

**Competition From Czechs**—But now from behind the Iron Curtain, Czech turret lathes, gear cutters and similar tools are being sacrificed at 30-40 pct below the German models. This is about half of the U. S. used price. These were turned out in major volume for Russia by such companies as the Skoda Works. Quality is tops. But there have been mass cancellations from Russia because the USSR cannot absorb them fast enough and is also starting to make its own.

**And From the Chinese** — Even Northern China is starting to produce crude engine lathes, and Rumanians are turning out shapers, drills, and radial drills. What is left for U. S. dealers is an extremely narrow specialty machine field. These machines are not even broad enough to cover specific industries, but mostly isolated jobs in a single plant.

U. S. dealers are selling by personal visits and through established contacts. And rarely does the price gained justify the high expense of foreign sales calls.

**Plus Trouble at Home** — Compounding the dim outlook of U. S. exporters is more competition from their own backyard. With domestic business off, many more dealers are attempting to edge into the field for the first time on a large scale. Their main leverage is price competition which is hard to counteract with claims of better service, re-conditioning, and accessories.

## National Sales Improve

February sales of used machine tools were at the highest level of any month since April, 1957, according to the Machinery Dealers National Association.

The month's index of 148.1 was considerably above the January index of about 110. The average index for sales during all of 1958 was 114.5.

## Coming Auction

A two-day sale will be held at Bridgeport, Conn., plants of Underwood Corp. on April 14 and 15. Included among equipment for sale will be millers, automatic screw machines, drills, presses, grinders, lathes, and sheet metal machinery.

# CONSIDER GOOD USED EQUIPMENT FIRST

**BENDING ROLLS**
10' x 10 Ga. Bertsch No. 6 Initial Type
12 x ⅜" Hilles & Jones Pyramid Type
14' x 1 3/16" Bertsch Initial Type—LATE
32' x ¾" BALDWIN PYRAMID TYPE—LATE

**BRAKE—LEAF TYPE**
12' x ½" Dreis & Krump

**BRAKES—PRESS TYPE**
500 ton Pacific 12' Bending Length, Hydraulic

**CRANES—OVERHEAD ELECTRIC TRAVELING**

| | |
|---|---|
| 3 ton P&H | 40' Span 220 Volt D.C. |
| 5 ton P&H | 57' Span 220/3/60 A.C. |
| 8 ton P&H | 55' Span 230/3/60 |
| 10 ton P&H | 39' Span 230 Volt D.C. |
| 10 ton Milwaukee | 57' Span 230 Volt D.C. |
| 10 ton Shaw | 48' Span 230 Volt D.C. |
| 10 ton Whiting | 75' Span 220/3/60 A.C. |
| 10 ton Shaw | 120 Span 230 Volt D.C. |
| 15 ton N-B-P | 100' Span 220/3/60 A.C. |
| 30 ton Shaw | 70' Span 230 Volt D.C. |
| 120 ton Niles | 67' Span 230 Volt D.C. |
| 120 ton Shepard Niles | 77' Span 220/3/60 A.C. |

**CRANE—TRAMRAIL TRAVELING**
56 ft. Bridge, Three 215 ft. Runways
82 ft. Bridge, Four Runways 215' & 135'
Motors 208 Volt 3 Phase 60 Cycle

**DRAW BENCHES**
7,000 lb. Draw Bench, 51 ft. Draw
10,000 lb. Draw Bench, 50 ft. Draw
35,000 lb. Draw Bench, 41 ft. Draw

**FORGING MACHINES**
1" to 5" Acme, Ajax, National

**FURNACES—HEAT TREATING**
Electric Furnace Co. Batch Type, Max Load 10,000#
Effective Hearth Area 10' x 12' 6" x 40" ht.

**HAMMERS—BOARD DROP—STEAM DROP—STEAM FORGING** 800 lb. to 12,000 lb. incl.

**LATHE**
24" Swing x 48" Monarch Model 22GM—New 1942

**LEVELERS—ROLLER**
50" Processor & Leveler, Capacity 50" x .100"
66" Guide 17 Rolls 4½" Dia.
72" Leveler 17 Rolls 2⅝" Backed Up

**MULTI SLIDE MACHINE**
No. 35 U.S. Multi-Slide, Max. Capy. 4¼" wide x .089

**NIBBLER**
Pullmax Model 2, Capacity 11/32"

**PRESS—EMBOSSING & COINING**
#664 Toledo 600 ton, 2" Stroke

**PRESSES—HYDRAULIC**
300 ton Southwark, Bed 28" x 28", Stroke 25"
500 ton Watson Stillman Piercing Press, 48" x 72"
500 ton HPM Fastraverse, Bed 36" x 36"
600 ton Birdsboro, Platen 48 x 48", Stroke 15"
1000 ton Southwark, Bed 44" x 54", Stroke 20"
4500 ton B-L-H Bed 68 x 68", Stroke 40"

**PRESSES—STRAIGHT SIDE**
190 ton Toledo #57½, Bed Area 29 x 29", Stroke 10"
215 ton Clearing, Bed Area 36 x 42", Stroke 24"
260 ton Cleveland #7F, Bed 42 x 84", Stroke 12"
500 ton Hamilton #1810¼, Area 19x17½", Stroke 1½"
900 ton Hamilton 4E-1809, Bed 101x181", Stroke 30"

**PUNCH & SHEAR COMBINATIONS**
#1½ Buffalo Universal Ironworker
KF Cleveland, 60" Throat

**ROLLING MILLS**
3¼" x 7" Six Roll Cluster Mill
10" x 14" Single Stand Two High
10" x 16" Single Stand Two High
12" x 16" Single Stand Two High
16" x 24" Two Stand Two High
20" x 36" Single Stand Two High
26" x 60" Single Stand Two High
10" Morgan Merchant Mill
12" x 32" Birdsboro 3-Hi Bar Mill
22" x 46" Lewis 3-Hi Sheet Mill

**ROLLS—FORMING**
6 Stand Dahlstrom #450-6 for stock to 4½" wide
18 Stand Custom Built, 2½ Shaft, will take 36" wide

**ROLL—PLATE STRAIGHTENING**
72" McKay, 20 Rolls 15" Dia. Infeed & Outfeed Rolls, 150 H.P. Main Drive Motor

**SHEAR—GATE**
8' x 1" RD Wood Hydraulic

**SHEAR—ROTARY**
No. 23A Quickwork Whiting 3/16" Capacity

**SHEARS—SQUARING**
6" x 14 Ga. Edwards, Motor Drive—LATE
10' x 10 Ga. Wysong & Miles
10' x ⅛" Niagara #810
12' x 16" Cincinnati #1412

**SLITTER**
24" Torrington Slitting Line, 3½" Arbor

**STRAIGHTENERS**
Torrington #1734 12-Roll, Capy. 1¾", Rd. 1-9/16"
⅝" Shuster Straightener, 12 Ft. Cut-off

**SWAGING MACHINES**
#6A Fenn, Capy. 3¾" Tube, 1¼" Solid, 10" Die Length. With Hydraulic Feed

**TESTING MACHINES**
20,000 lb. Baldwin Univ. Hydraulic
60,000 lb. Southwark-Emery Universal Hydraulic
500,000 lb. Olsen, Super DeLuxe Compression

**WIRE DRAWING MACHINES**
Type B Morgan 4-Block Capy. #5' Rod down
Scudder 3-Block 20 Dia.
Superior 7-Draft Cone Type, Capy. 14 Ga. down
Vaughn 5 Block, Ea. block M.D. Capy. # down

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IMMEDIATE DELIVERY
ALL TYPES

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RECONDITIONED OR "AS IS"

*Freight car repair parts, relay rails, cross-ties, accessories*

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*Keep 'em rolling . . . not rusting*

**FOR SALE**

New—Used—Reconditioned railroad freight cars • car parts • locomotives • tank cars • steel storage tanks.

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THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

**GEAR SHAPERS**
Type Z Fellows Horizontal, m.d.
No. 4 Fellows Enveloping Gear Generator, m.d.
No. 12 Fellows Gear Shaving Machine, m.d. late
No. 7 Fellows, 1945
No. 7, 7A Fellows Gear Shapers, belted m.d.
No. 18 Fellows Gear Finishing Machine, m.d.
No. 61A Fellows, m.d., latest type, 1945
No. 615A Fellows Spur & Helical, belt drive
No. 645A Fellows, m.d.
No. 645A3 Fellows, vee belt drive
No. 645Y Fellows, m.d.
No. 70 Cross Deburring Machine, m.d., 1940
No. 72 Fellows H.S. Spur Gear Shaper, m.d.
No. 725 Fellows, 1945
No 75 Fellows, H.S., m.d.
No. 75A Fellows, H.S. Spur & Helical, m.d.
No. 712 Fellows, m.d.
No. 7125A Fellows, H.S., m.d.

**GEAR CUTTERS**
No. 12 Gleason Straight Tooth Bevel Gear Rougher, m.d.
No. 36 Gould & Eberhardt Bevel & Spur Gear Rougher, m.d.
No. 48 Fellows Gear Burnisher
No. 88 Fellows Gear Burnisher
3" Gleason Gear Generator, m.d.
48" Gleason Automatic Bevel Gear Planer, m.d.
No. 5AC Lees-Bradner Heavy Type Gear Generator, m.d.
No. 4-48" Brown & Sharpe, m.d.
No. 50 Cross Clutch Miller, m.d.

**SURFACE GRINDERS**
No. 16 Blanchard Rotary, m.d.
No. 16A-2 Blanchard Auto. Rotary, m.d.
No. 33 Abrasive, m.d.
14" Pratt & Whitney Vertical, m.d.
14" Pratt & Whitney Model M 1640 Vertical, m.d.
No. A-1-8" Arter Surface Grinder
No. 22-12 Heald Rotary, m.d.
No. 25-A-24" Heald Rotary, m.d.
No. 2 Brown & Sharpe, m.d.
#300-60 Hanchett Vertical Spindle, m.d
Model 84A-61" Bridgeport Hydraulic Face, m.d.
Schonherr Way Grinder, radial arm

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MElrose 1241 "TWX" CI 174 CABLE ADDRESS—EMCO

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*GUARANTEED*—RE-NU-BILT

## Electric Power Equipment—A. C. Motors

*3 phase—60 cycle*

**SLIP RING**

| Qu. | H.P. | Make | Type | Volts | Speed |
|---|---|---|---|---|---|
| 1 | 1750 | G.E. | M-579BS | 4800 | 1800 |
| 1 | 1500 | G.E. | MT | 6600 | 1187 |
| 1 | 800 | Whse. | CW | 550 | 1776 |
| 1 | 700 | A.C. | | 2300 | 500 |
| 1 | 600 | Whse. | CW-4-32D-15 | 440 | 1778 |
| 1 | 500 | G.E. | MT-412 | 2200 | 439 |
| 1 | 500 | Whse. | CW | 550 | 350 |
| 1 | 200 | G.E. | IM | 440/2200 | 580 |
| 1 | 125 | G.E. unused | MT-557 | 220/440 | 1200 |
| 1 | 100 | G.E. | MT-564 | 440/2200 | 450 |
| 1 | 250 | G.E. | IM-16 | 220/440 | 875 |
| 1 | 250 | G.E. | MT563Y | 220/440 | 875 |
| 1 | 250 | A.C. | Any | 550 | 600 |
| 1 | 250 | Whse | CW | 2200 | 450 |
| 1 | 250 | Cr.Wh. | Size 29Q | 2300 | 350 |
| 1 | 250 | G.E. | MT-424Y | 4000 | 257 |
| 1 | 250 | G.E. | IE-13B | 220 | 1800 |
| 2 | 200 | Whse. | CW-890 | 2300 | 1775 |
| 1 | 200 | Whse. | CW-874D | 220/440 | 885 |
| 1 | 200 | Cr.Wh. | 8R-26QB | 440 | 505 |
| 2 | 200 | G.E. | IM-17A | 2200 | 435 |
| 3 | 100 | A.C. | | 440 | 695 |

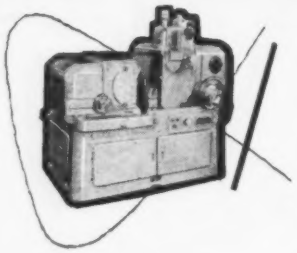
**SQUIRREL CAGE**

| | | | | | |
|---|---|---|---|---|---|
| 2 | 100 | Whse. | B.B.CS-607 | 220/440 | 1780 |
| 1 | 800 | G.E. | KT-578 | 2200 | 1180 |
| 1 | 500 | G.E. | FT-559AY | 2200 | 3600 |
| 2 | 500 | Whse. | CS-1115 | 3300 | 863/445 |
| 4 | 500 | Whse. | CS-1216 | 2200 | 500 |
| 1 | 400 | Whse. | CS-7151-610H | 6600/4000 | 3585 |
| 1 | 300 | Whse. | CS-1003 | 2300/440 | 600 |
| 2 | 200 | Whse. | CS-355S D.P. | 220/440 | 1750 |
| 1 | 150 | G.E. | FT-558 | 2200 | 875 |
| 1 | 150 | Whse. | CS | 440 | 580 |
| 1 | 125 | Whse. | CS-764C | 220/440 | 1160 |
| 3 | 100 | Whse. | CS-760C | 2200/440 | 1100 |

**SYNCHRONOUS**

| | | | | | |
|---|---|---|---|---|---|
| 1 | 6000 | G.E. | ATI .8 P.F. | 2200/6600 | 600 |
| 1 | 3500 | G.E. | TS 1.0 P.F. | 4600/2300/4000 | 360 |
| 1 | 2500 | Whse. | .8P.F. | 2300 | 720 |
| 1 | 2000 | G.E. | ATI | 2300 | 900 |
| 2 | 1750 | G.E. | ATI | 2300 | 3600 |
| 1 | 1750 | G.E. | TS | 2300/4600 | 900 |
| 1 | 785 | G.E. | ATI | 2200/1200 | 600 |
| 2 | 700 | G.E. | TS .8P.F. | 2200 | 1200 |
| 1 | 350 | Whse. | 1.0P.F. | 440 | 900 |
| 2 | 250 | G.E. | ATI 1.0P.F. | 2300 | 150 |
| 1 | 325 | G.E. | ATI 1.0P.F. | 440 | 1800 |

**BELYEA COMPANY, Inc.**
47 Howell Street, Jersey City 6, N. J.
Tel. OL 3-3334



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This Landis No. 12 Centerless grinder is an example from our large stock of modern tools rebuilt by Miles to perform like new and ready for immediate shipment. Price $7500.

**UPSETTERS**

3" Ajax susp. sl., air clutch, 1936
4" National air clutch, 1944
4" National susp. sl., guided ram

**PRESSES**

50-60 ton Henry & Wright dieing 1940, good
70 ton. No. 10-7 Minster
90 ton No. 75 Bliss horning
106 ton No. 56 Toledo s.s.c. trim
110 ton No. 675-B Bliss, 1937
370 ton No. 18S Cleveland s.s.c.
400 ton No. 663 Toledo knuckle coining
600 ton No. 644 Toledo knuckle coining

**MISCELLANEOUS**

BULLDOZER. 180 ton No. 27 Williams & White
BOLT SHAVER. Type KK Economy, hopper
PUNCH & SHEAR. 38" throat new Doty
MILLER. 42" x 42" x 18' Ingersoll, adj. rail
LATHE. 90" Betts-Bridgeford headstock, 1941
ROLL. No. 18 Kane & Roach Straightening, 2½"
SAW. 10½" x 10½" No. 3 Motch & Merry-weather, hydraulic, 9 feeds, late
SLOTTER. 36" Rockford Hydr., 1942
THREADER. 1½" Hill Acme lead screw, 1942
COIL CRADLE. Cleveland uncoilers, 72" wide

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*AMERICA'S LARGEST STOCK OF FOUNDRY EQUIPMENT*

**ARC MELTING FURNACES**

1—250# LECTROMELT—300 KVA
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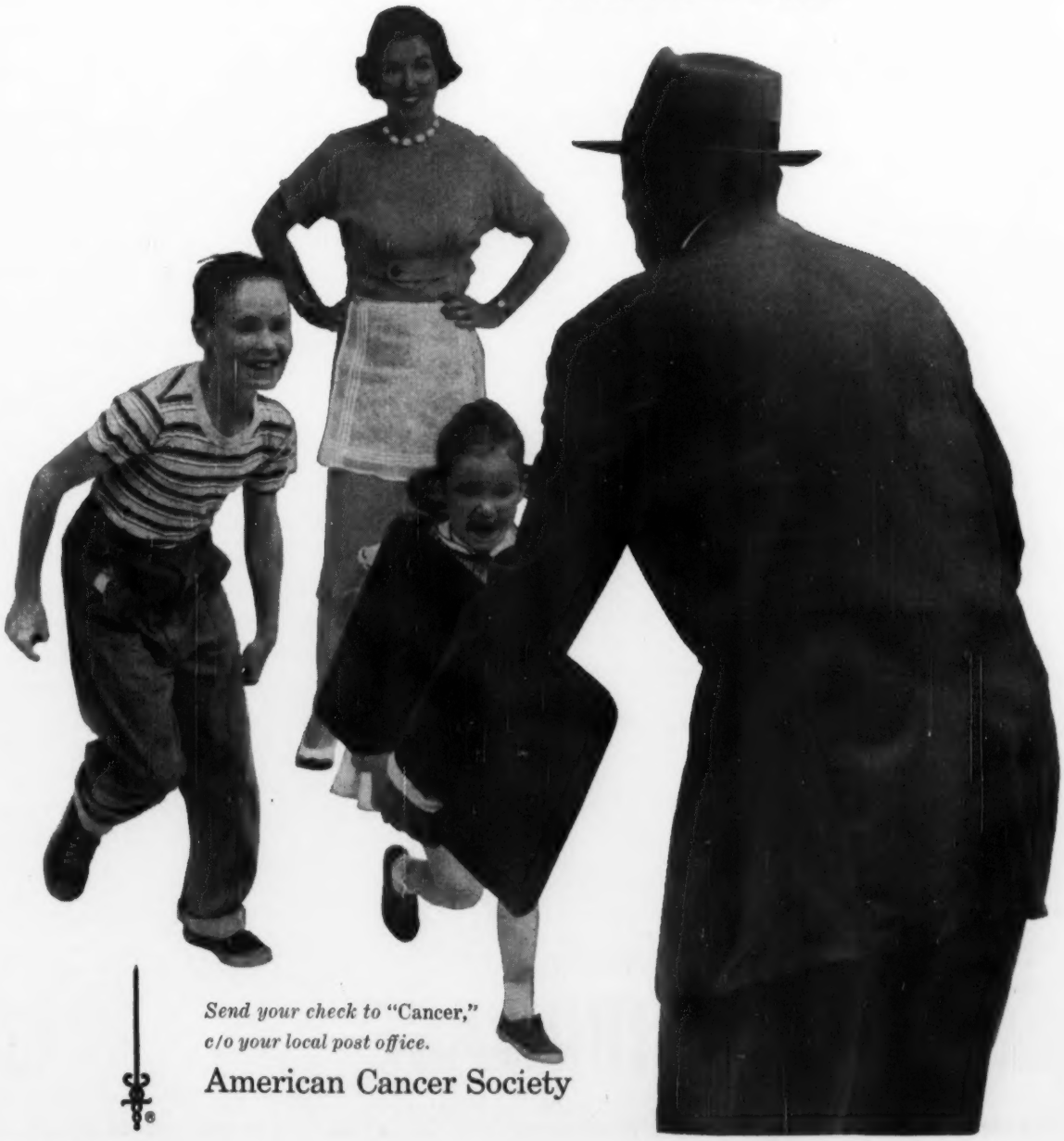

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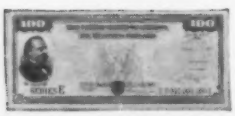

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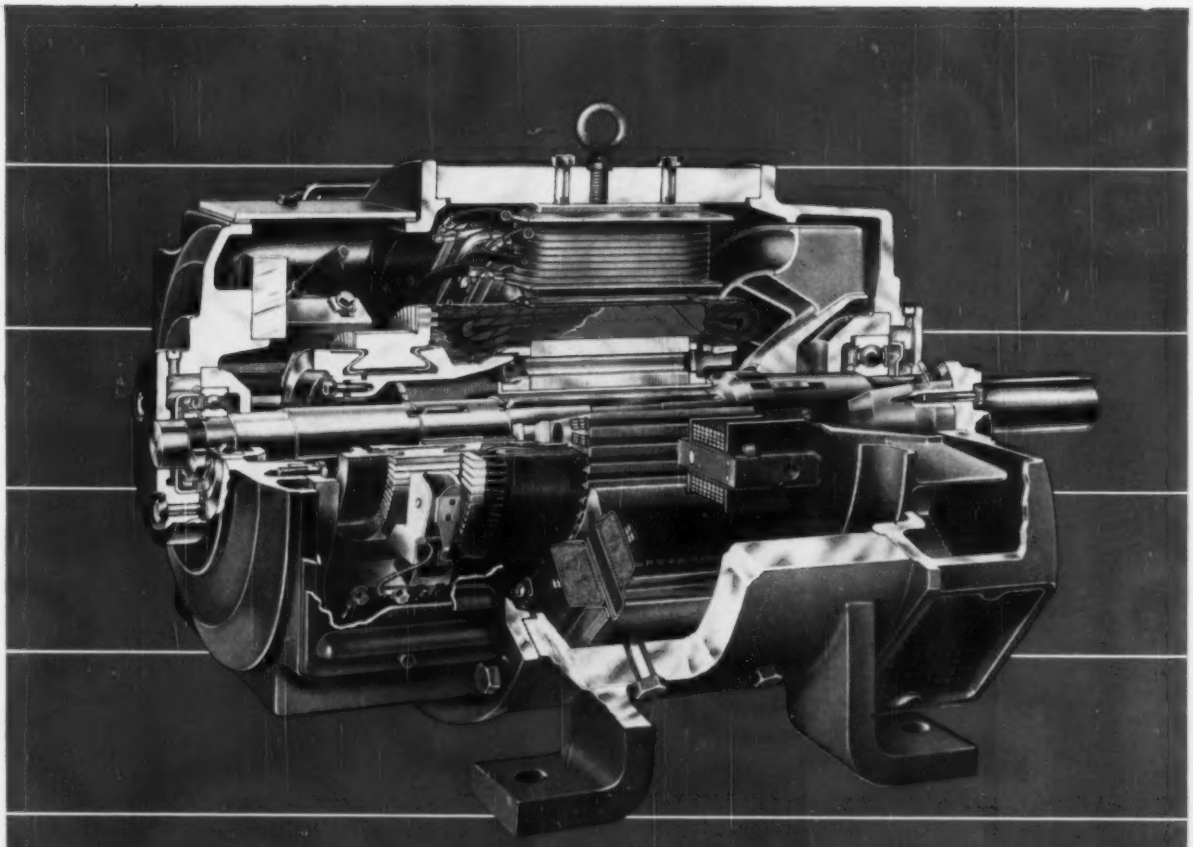
Acme Steel Strapping secures the hopper body to the flat car, and the trucks are braced at each end of the body.

Ortner Company finds that by using steel strapping the hopper cars are loaded and braced in about half the time and at about one-third the material cost required by other bracing methods.

***Call your Acme Idea Man.** He will show you how Acme Steel Strapping can help solve your product handling and shipping problems. Phone him at the nearest Acme Steel office. Or write Dept. IFU-49, Acme Steel Products Division, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Company of Canada, Ltd., 743 Warden Ave., Toronto 13, Ontario.

ACME STEEL **STEEL STRAPPING**



# THE RELIANCE SUPER 'T'

## A New Kind of D-c. Motor With DYNAMIC RESPONSE

Here is a motor built to make maximum use of d-c. flexibility. The Super 'T' puts Dynamic Response into starts, stops, and speed changes. Dynamic Response gives you a 50% increase in torque and a 50% decrease in reaction time.

This top performance is due to advanced, balanced design. Lighter small diameter armatures cut mechanical inertia 50%. Superior Class B insulation, gives extended life even at temperatures as great as 130°C.

Top grade insulation plus engineered ventilation lets the Super 'T' take tremendous overloads. In fact, the Super 'T' can develop double normal horsepower during starts, stops, and speed changes.

The Super 'T' is a compact power package, designed inside and out for tough industrial service. From appearance to performance, the Reliance Super 'T' with Dynamic Response is today's most modern industrial motor.

C-1577

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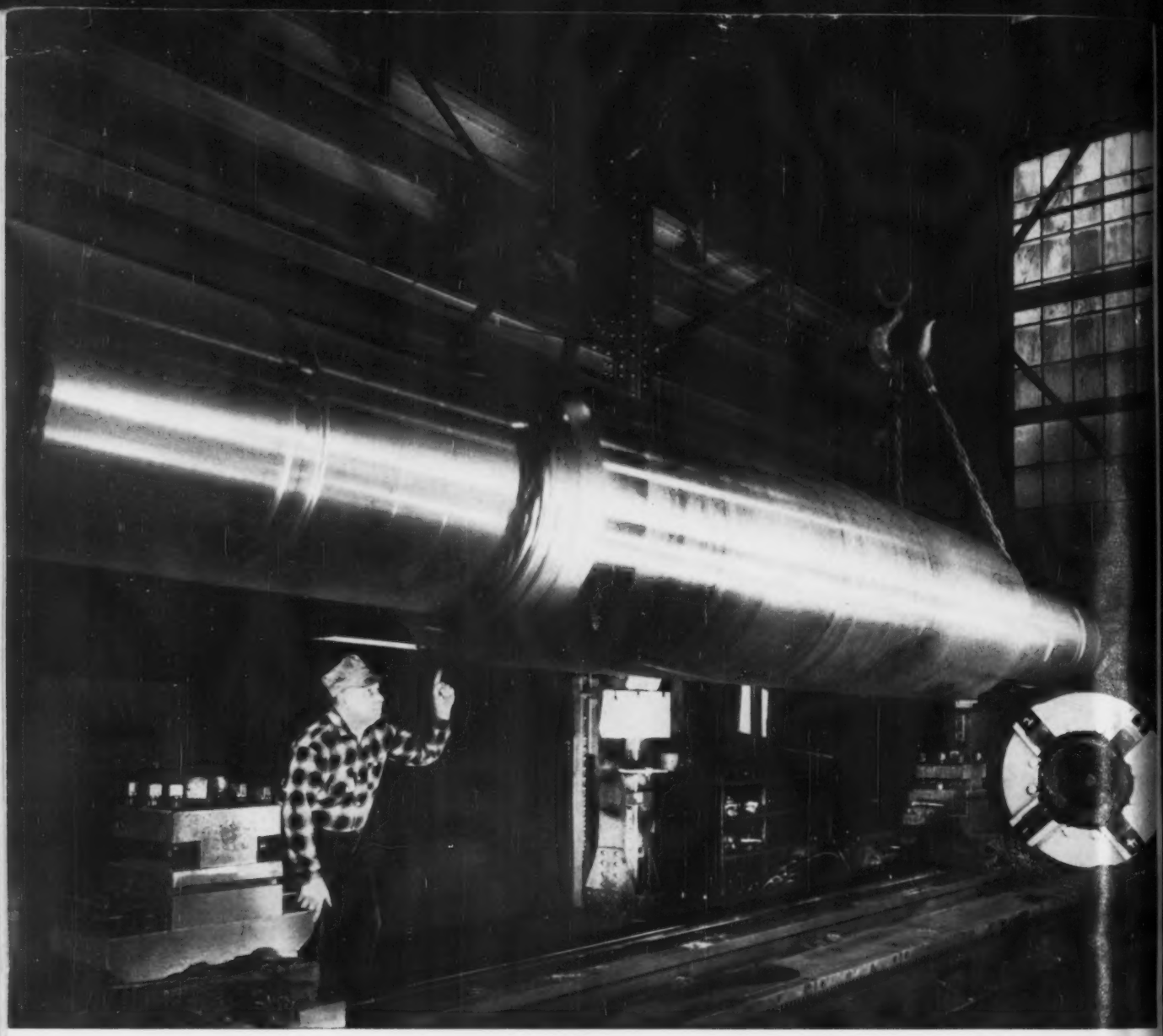

## The big boy sheds some weight...

...About three tons of it just came off in that lathe. For this "big boy" is a forty-ton plate mill roll—one of the largest made.

While no one here at Mack-Hemp was so blasé that he ignored this roll as it went through the shop, no one was overly impressed, either. Regardless of size, every roll that's poured here at Mack-Hemp receives the full measure of painstaking care—which is why *you get more tonnage from the rolls with the striped red wabblers.*

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**MACKINTOSH-HEMPHILL Division of E. W. BLISS Company**

**901 Bingham Street, Pittsburgh 3, Pa.**